Chapter 4
Management

Key Questions:

a) *What is the legal framework under which fishery management operates?*
b) *What are trends in the catch and effort in steelhead fisheries?*
c) *What are angler preferences for gear and regulations?*
d) *What strategies and tools are available and used to manage steelhead fisheries?*

4.1 Introduction

In an appeal for a new era in fisheries management, Walters and Martell (2004) suggest that "the central objective of modern fisheries science should be to clearly expose trade-offs among conflicting objectives, and the central objective of fisheries management should be to develop effective ways to decide where to operate along the trade-offs, and how to operate successfully."

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>
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In this chapter, we strive to apply these concepts to Washington steelhead. We begin by describing the legal framework under which fisheries are managed, the catch and effort in sport and tribal fisheries, and angler preferences for regulations and gear. We then explore the trade-offs between objectives of fishery management as embodied in the comanagers goal statement, alternative fishery management strategies, and fishery regulation tactics. Finally, we identify several remaining technical questions related to fishery management that will be broadly discussed in the final version of this report and more specifically addressed in subsequent fishery management plans.

4.2 Value of Fisheries

4.2.1 Value of Recreational Fishery

Perhaps no better icon of the Pacific Northwest exists than steelhead (*Oncorhynchus mykiss*). Their sleek bodies, their preference for swift water, and their habit of returning to even the most remote mountain streams have resulted in Northwest lore that is rich with stories of recreational fishing trips in search of the elusive and explosive steelhead.

Photo 4-1. Recreational fisheries for steelhead result in an annual economic benefit to the State of Washington of over $200 million dollars. Photo source: unknown.

Recreational fisheries for steelhead also provide significant economic benefits withl an estimated economic benefit of over $200 million dollars to Washington State (see Box 3-1 for summary of economic analysis). During the 1995-1996 through 2003-2004 seasons, the estimated economic output associated with recreational fisheries for summer steelhead was $133.2 million dollars, with the greatest output ($119.8 million dollars) associated with fisheries in the Columbia River basin. The estimate economic benefit of recreational fisheries for winter steelhead was $68.1 million dollars.

Table 4-1. Approximate economic output associated with the catch of natural- and hatchery-origin steelhead in Washington sport fisheries.

Geographic Region	Summer Steelhead	Winter Steelhead	Total
Strait of Juan de Fuca & Puget Sound	$9.8 million	$19.5 million	$29.3 million
Washington Coast	$3.7 million	$27.3 million	$30.9 million
Columbia River Basin	$119.8 million	$21.3 million	$141.1 million
Total	$133.2 million	$68.1 million	$201.3 million

4.2.2 Importance to Tribal Culture

The importance of salmon and steelhead to the northwest Native American culture has been extensively documented (cf., Ballard 1927; Ballard 1929; Gunther 1950; Swindell 1942). This cultural role is reviewed in NMFS (2004) from which the following summary is drawn.

> "Salmon is ubiquitous (omnipresent) in Indian culture within the action area {Puget Sound}. It is regularly eaten by individuals and families, and served at gatherings of elders and to guests at feasts and traditional dinners. Salmon is treated ceremoniously by Indians throughout the action area at present as it has been for centuries. Salmon is of nutritional, cultural, and economic importance to tribes. To Indians of the action area, salmon is a core symbol of tribal identity, individual identity, and the ability of Indian cultures to endure. It is a constant reminder to tribal members of their obligation as environmental stewards. Traditional Indian concepts stress the relatedness and interdependence of all beings including humans within the action area. Thus, the survival and well-being of salmon is seen as inextricably linked to the survival and well being of Indian people and the cultures of the tribes. Many Indian people within the action area share traditional stories that explain the relationship between mountains, the origins of rivers, and the origins of salmon that inhabit the rivers (Ballard 1929). In traditional stories, even the humblest of creatures play important roles in sustaining life and balance in the ecological niche that has supplied food for Indian people for generations (Ballard 1927). Stories recount the values Indian people place on supporting healthy, welcoming rivers and good salmon runs. Salmon is also a symbol used in art and other representations of tribal identity."

> "The availability of salmon as an economic base and a cultural, ceremonial, and religious staple has provided for enhanced social cohesion and promoted cultural vitality among Puget Sound tribes. Its centrality to the Indian culture has been reaffirmed by court cases like U.S. v. Washington. Some refer to it as "a calling back home." In many instances, Indian people came back to live with relatives and friends on reservations because there was economic opportunity. The enhanced fisheries opportunities demanded that new generations of fishermen and women be trained. The core group of elders and fishermen who had local knowledge of the waters, the currents, the tides, the habits of fish, and the requirement of habitat came forward to train others in this specialized cultural knowledge. New technologies were learned and taught along with the guidance of local, traditional knowledge. Indian people express a holistic relationship to the land and the waterways, as well as to the salmon and other creatures dependent upon the health of the land and environment.

Little differentiation is made between and among spirit, nature, and culture when they speak of their obligations. Tribal people characterize their relationship to salmon as a dynamic and demanding one. The relationship draws upon indigenous teachings and insights. The obligation to salmon articulated by Indian people is one concerned with renewal, reciprocity, and balance. Salmon is of economic importance to Indian people, and it embodies cultural, ceremonial, and social dimensions of their lives to the degree that it is a significant symbol of Indian and tribal identity. Tribal identity is realized and expressed in the many daily acts in which they engage. For the Indian people within the Puget Sound Action Area, many of those acts involve or include salmon. Tribal people have a strong present connection with salmon, and share a passionate concern for the future of salmon in the marine waters, rivers, lakes, and streams in the action area."

Photo 4-2. Salmon and steelhead are of economic importance to Indian people, and it embodies cultural, ceremonial, and social dimensions of their lives to the degree that it is a significant symbol of Indian and tribal identity. Photo Source: University of Washington.

4.3 Legal Framework

4.3.1 Native American Fishing Rights

Many of Washington's steelhead fisheries are comanaged with Native American tribes in a unique government-to-government relationship defined by treaties, court decisions, and legislation. Since the management of steelhead in many areas of Washington depends to a substantial extent on this relationship, we have included a fairly extensive description of Native American fishing rights to provide context for the subsequent discussion of management strategies and tools. This description is adapted from a paper by Woods (2006) who also provided a listing of Treaty tribes (i.e., entitled to exercise treaty rights), federally recognized non-treaty tribes, and non-treaty tribes that are not federally recognized (Appendix 4-1).

Indian Treaties

Congress created Washington Territory in 1853 out of a portion of Oregon Territory. It encompassed what is now Washington and parts of Idaho and Montana. In 1854 and 1855, at the direction of the Indian Office in Washington, D.C., Isaac Stevens and Joel Palmer (superintendents for Indian Affairs in the Washington and Oregon territories, respectively), concluded eleven treaties with Indian tribes in Washington Territory and adjacent parts of Oregon Territory.[1] Stevens was instructed to clear title to the lands, and to collect the Indians on reservations, where they would be taught farming and trades. Ten of the treaties he and Palmer concluded contain a provision substantially similar to the following:

> **The right of taking fish, at all usual and accustomed grounds and stations, is further secured to said Indians, in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses on open and unclaimed lands:**

Medicine Creek Treaty, art. III, 10 Stat. at 1133.

Some Indian groups in Washington Territory did not sign treaties, but obtained reservations through other federal actions. One group of tribes, the Colville Tribes, has off-reservation hunting and fishing rights in an area that was once part of the Colville

[1] Treaty With Nisquallys (Treaty of Medicine Creek), 10 Stat. 1132 (Dec. 26, 1854) (http://www.nwifc.wa.gov/pdf_public/Treaty_of_Nisqually.pdf); Treaty With the Dwámish Indians (Treaty of Point Elliott), 12 Stat. 927 (Jan. 22, 1855) (http://www.nwifc.wa.gov/pdf_public/Treaty_of_Dwamish.pdf); Treaty With the S'Klallams (Treaty of Point No Point), 12 Stat. 933 (Jan. 26, 1855) (http://www.pnptc.org/treaty_of_point_no_point.htm); Treaty With the Makah Tribe (Treaty of Neah Bay), 12 Stat. 939 (Jan. 31, 1855) (http://www.nwifc.wa.gov/pdf_public/Treaty_of_the_Makah_Tribe.pdf); Treaty With the Walla-Wallas, 12 Stat. 945 (June 9, 1855) (http://www.umatilla.nsn.us/treaty.html); Treaty With the Yakamas, 12 Stat. 951 (June 9, 1855) (http://www.critfc.org/text/yaktreaty.html); Treaty With the Nez Percés, 12 Stat. 957 (June 11, 1855) (http://www.ccrh.org/comm/river/treaties/nezperce.htm); Treaty With the Tribes of Middle Oregon, 12 Stat. 963 (June 25, 1855) (http://www.warmsprings.com/Warmsprings/Tribal_Community/History__Culture/Treaty__Documents/Treaty_of_1855.html); Treaty With the Qui-Nai-Elts (Treaty of Olympia), 12 Stat. 971 (July 1, 1855) (http://www.nwifc.wa.gov/pdf_public/Treaty_of_Quinaielt.pdf); Treaty With the Flatheads (Treaty of Hell Gate) (http://digital.library.okstate.edu/kappler/Vol2/treaties/fla0722.htm), 12 Stat. 975 (July 16, 1855); Treaty With the Blackfoot Indians, 11 Stat. 657 (Oct. 17, 1855) (http://digital.library.okstate.edu/kappler/Vol2/treaties/bla0736.htm). Attorneys in Washington may also have occasion to address claims under the Treaty With the Shoshonees and Bannacks (Treaty of Fort Bridger), 15 Stat. 673 (July 3, 1868) (http://digital.library.okstate.edu/kappler/Vol2/treaties/sho1020.htm).

Indian Reservation (the "North Half"), under a Congressionally-ratified agreement.[2] The Colville and Spokane Tribes have statutory fishing, hunting, and boating rights in a portion of Lake Roosevelt (the reservoir behind Grand Coulee Dam).[3] No other non-treaty tribe has off-reservation rights in Washington that are different from those of the general public at this time.

Court Interpretation of the Treaties: Key Concepts and Cases

Dozens of court decisions have interpreted the treaty "right of taking fish". Key concepts in these decisions are summarized below.

- **The Treaties Secure Rights that are Different From Those of the General Public**

Outside of Indian reservations, Indians are presumed to be subject to nondiscriminatory state law absent express federal law to the contrary.[4] A treaty or statute may be such express federal law.[5] "An ethnic Indian who is not a member of a tribe with reserved fishing rights is in the same position with respect to Washington fish and game laws as any other citizen of the state."[6]

The first published court decision construing the treaty "right of taking fish" in the Stevens/Palmer treaties was an 1887 decision of the Washington Territorial Supreme Court. The United States sought to enjoin a settler who was restricting Yakama Indians' use of a traditional fishing site adjacent to his land. The Court rejected the settler's argument that, because Indians were not then citizens of the United States, the treaty language securing rights "in common with citizens" meant that Indians were guaranteed

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[2] *Antoine v. Washington*, 420 U.S. 194 (1975), *rev'g State v. Antoine*, 82 Wn.2d 440, 511 P.2d 1351 (1973).

[3] 16 U.S.C. § 835d.

[4] *Mescalero Apache Tribe v. Jones*, 411 U.S. 145, 148-49 (1973); *United States v. Washington*, 520 F.2d 676, 684 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976); *People v. Patterson*, 5 N.Y.3d91, 96, N.E.2d 223, 800 N.Y.S.2d 80 (2005)("Absent a treaty fishing right, the State enjoys the full run of its police powers in regulating off-reservation fishing"), cert. denied, 126 S.Ct. 1045 (2006); *see State v. Quigley*, 52 Wn.2d 234, 324 P.2d 827 (1958) (Chinook Indian was subject to state hunting laws). *See also Wagnon v. Prairie Band Potawatomi Nation*, 126 S. Ct. 676, 6688 (2005).

[5] *Cree v. Waterbury*, 78 F.3d 1400, 1403 (9th Cir. 1996) (Yakama Treaty public highways clause); *United States v. Washington*, 520 F.2d 676, 684 (9th Cir. 1975) (treaty fishing clause), *cert. denied*, 423 U.S. 1086 (1976); *see Antoine v. Washington*, 420 U.S. 194 (1975) (statute); *Puget Sound Gillnetters Ass'n v. Moos*, 92 Wash.2d 939, 951, 603 P.2d 819, 825 (1979) (treaty fishing clause).

[6] *Puget Sound Gillnetters Ass'n v. U.S. District Court*, 573 F.2d 1123, 1130 (9th Cir. 1978), *vacated on other grounds*, *sub. nom Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658 (1979).

the same rights as citizens. The Court held that the Yakama Treaty preserved rights that the Indians had exercised before the treaty was executed, rights that were different from those of citizens.[7] Most courts since then have applied the same principle.[8]

- **Tribes and Non-Indian Sovereigns Hold the Treaty Rights. The Rights are Not the Property of Individuals**

The Indians' rights under the treaties belong to tribal groups, not to individual persons of Indian ancestry.[9] Only tribal members may exercise treaty rights; others may not exercise a treaty right on a tribal member's behalf.[10]

As the holders of the treaty rights, Tribes have authority to regulate their members who take fish at the Tribe's off-reservation usual and accustomed places.[11] Tribal regulations do not preempt state law [12], though, as discussed below, the treaties do preempt state law to a large extent. It is not double jeopardy under the state double jeopardy statute to prosecute an Indian for violating state law when the defendant's tribe

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[7] *United States v. Taylor*, 3 Wash. Terr. 88, 13 P. 333 (1887), *enforced*, 44 F. 2 (C.C.D. Wash. 1890).

[8] *E.g.*, *United States v. Winans*, 198 U.S. 371 (1905); *Tulee v. Washington*, 315 U.S. 681, 684 (1942); *Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 673-9 (1979); *Puget Sound Gillnetters Ass'n v. Moos*, 92 Wn.2d 939, 948, 603 P.2d 819, 824 (1979).

[9] *E.g., Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 679 (1979); *Conley v. Ballinger*, 216 U.S. 84, 90-91 (1910); *Blackfeather v. United States*, 190 U.S. 368, 377 (1903); *United States v. Washington*, 641 F.2d 1368 1372-73 (9th Cir. 1981), *cert. denied*, 454 U.S. (1982); *Puget Sound Gillnetters Ass'n v. U.S. District Court*, 573 F.2d 1123, 1126 (9th Cir. 1978) ("These rights were reserved, not by the individuals who happened to be alive in 1854 or 1855, but by tribes"), *vacated on other grounds*, 443 U.S. 658 (1979); *Whitefoot v. United States,* 293 F.2d 658, 663, 155 Ct. Cl. 127 (1961), *cert. denied,* 369 U.S. 818 (1962); *State v. Posenjak*, 127 Wn. App. 41, 48, 111 P.3d 1206, 1211 (2005).

[10] *Cree v. Waterbury*, 873 F. Supp. 404, 428-29 (E.D. Wash. 1994) (Yakama Treaty public highways right), *rev'd on other grounds*, 78 F.3d 1400 (9th Cir. 1996); *United States v. Washington*, 384 F. Supp. 312, 412 (W.D. Wash. 1974) ("Boldt decision"), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976); *State v. Price*, 87 Wn. App. 424, 429-32, 942 P.2d 377, 380-81 (1997) (non-Indian spouse of Yakama tribal member could not exercise treaty right).

[11] *Settler v. Lameer*, 507 F.2d 231, 238 (9th Cir. 1974); *United States v. Washington*, 384 F. Supp. 312, 403 (W.D. Wash. 1974) (CL 36), *aff'd*, 520 F.2d 676, 686 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976).

[12] *U.S. v. Washington*, 384 F. Supp. at 403 (CL 37), 410.

has already prosecuted under tribal law.[13] The Tribes and the State have overlapping regulatory authority over fishing by treaty Indians.[14,15]

Tribes do not have authority to regulate non-members who take fish outside the Tribe's reservation.[16]

Non-Indians' rights under the treaties do not belong to individual persons; rather, non-Indians may take fish from state waters only to the extent state law allows it.[17]

- **The Treaty Fishing Right Applies to "Usual and Accustomed" Places: Places Where Indians Traditionally Fished**

The treaty "right of taking fish" applies only to "usual and accustomed" grounds and stations or places. A tribal member fishing at a place that is not a usual and accustomed fishing place of his or her tribe is not exercising a treaty right and is subject to state laws regulating fishing.[18]

The Washington Territorial Supreme Court held in 1887 that "usual and accustomed" grounds and stations or places are particular places where Indians traditionally fished before the treaties were executed.[19] Other courts have followed that interpretation.[20]

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[13] *State v. Moses*, 145 Wn.2d 370, 37 P.3d 1216 (2002) (hunting)

[14] *United States v. Washington*, 520 F.2d 676, 686-87 n.4 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976). "[T]ribal sovereignty, standing alone, does not preclude state jurisdiction over Indian conduct off-reservation." *Cree v. Waterbury*, 873 F. Supp. 404, 416 (E.D. Wash. 1994), *rev'd in part on other grounds*, 78 F.3d 1400 (9th Cir. 1996).

[15] *United States v. Washington*, No. 70-9213 Phase I, Subproceeding No. 96-3, *Stipulation and Order Concerning Co-Management and Mass Marking* (W.D. Wash. April 28, 1997).

[16] *See United States v. Washington*, 384 F. Supp. 312, 410 (W.D. Wash. 1974), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976). It is possible that tribes may have authority to regulate off-reservation fishing by Indians who are members of other tribes. *See United States v. Lara*, 124 S. Ct. 1628, 1636 (2004); 25 U.S.C. § 1301(2). In western Washington, however, the cited order in *U.S. v. Washington* precludes enforcement of such regulations.

[17] *Puget Sound Gillnetters Ass'n v. United States District Ct.*, 573 F.2d 1123, 1132 (9th Cir. 1978), *vacated on other grounds*, 443 U.S. 658 (1979); *Puget Sound Gillnetters Ass'n v. Moos*, 92 Wn.2d 939, 947-48, 603 P.2d 819, 824 (1979); *Purse Seine Vessel Owners Ass'n v. State*, 92 Wn. App. 381, 393-94, 966 P.2d 928, 935 (1998); *review denied*, 137 Wn.2d 1030, 980 P.2d 1284 (1999); *Atwood v. Shanks*, 91 Wn. App. 404, 413-14, 958 P.2d 332, 338, *review denied*, 136 Wn.2d 1029, 972 P.2d 464 (1998); *see United States v. Oregon*, 718 F.2d 299, 304 n.6 (9th Cir. 1983).

[18] *United States v. Washington*, 384 F. Supp. 312, 408 (W.D. Wash. 1974), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976); *Seufert v. Olney*, 193 F. 200, 203 (E.D. Wash. 1911).

[19] *United States v. Taylor*, 3 Wash. Terr. 88, 13 P. 333 (1887), *enforced*, 44 F. 2 (C.C.D. Wash. 1890).

"Usual and accustomed grounds" may include depths to which humans did not have access until modern technology became available, however.[21]

A party seeking to establish that a place is a tribe's "usual and accustomed place" must show the "tribe's (or its predecessors') regular and frequent treaty-time use of that area for fishing purposes."[22] Evidence that individual tribal members may have used a place at treaty time by virtue of marriage into other tribes does not establish that a place was a usual and accustomed place of the Tribe itself.[23] A place that was an "unfamiliar location," or "used infrequently or at long intervals and extraordinary occasions," or "where use was occasional or incidental," is not a usual and accustomed place.[24]

The testimony of an expert anthropologist, based on documentary evidence, can establish that a place was a tribe's treaty-time usual and accustomed fishing place. Tribal elder testimony may bolster such evidence, but may be insufficient by itself.[25] The testimony of a few tribal members that they fished at a place during the twentieth century is not enough to show that the place was a usual and accustomed fishing place of their tribe in 1855.[26]

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[20] *E.g.*, *Seufert Bros. Co. v. United States*, 249 U.S. 194 (1919) (Yakama); *United States v. Winans*, 198 U.S. 371 (1905) (Yakama); *United States v. Washington*, 730 F.2d 1314 (9th Cir. 1984) (Makah); *United States v. Washington*, 384 F. Supp. 312, 332, 353 (W.D. Wash. 1974) (14 tribes), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976); *United States v. McGowan*, 2 F. Supp. 426 (W.D. Wash. 1931) (Quinault).

[21] *United States v. Washington*, 157 F.3d 630, 643 (9th Cir. 1998), *cert. denied*, 526 U.S. 1060 (1999).

[22] *United States v. Washington*, 626 F. Supp. 1405, 1531 (W.D. Wash. 1985).

[23] *United States v. Washington*, 873 F. Supp. 1422, 1447 (W.D. Wash. 1994) (Yakama Nation failed to prove usual and accustomed shellfishing places in western Washington).

[24] *United States v. Washington*, 384 F. Supp. 312, 332, 353 (FF 14), 356 (FF 23) (W.D. Wash. 1974), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976).

[25] *United States v. Washington*, 459 F. Supp. 1020, 1059 (W.D. Wash. 1975); *State v. Courville*, 36 Wn. App. 615, 623, 676 P.2d 1011, 1016 (1983); *see State v. James*, 72 Wn.2d 746, 748, 435 P.2d 521, 522-23 (1967); *cf. Bonnichsen v. United States*, 367 F.3d 864, 881-82 (9th Cir. 2004) (describing limitations of oral history).

[26] *United States v. Washington*, 764 F.2d 670, 674 (9th Cir. 1985) (tribal elder testimony about fishing activity in early 1900s could not support finding about treaty time fishing places); *United States v. Washington*, 730 F.2d 1314, 1315, 1318 (9th Cir. 1984) (discounting elder testimony about fishing during the 1900s); *see State v. Petit*, 88 Wn.2d 267, 272-73, 558 P.2d 796, 798-99 (1977) (Utter, J., dissenting) (describing testimony that majority had held insufficient to show that a place was a usual and accustomed place).

In Western Washington, treaty tribes' usual and accustomed grounds and stations have been specifically determined in the "Boldt decision" and subsequent litigation.[27] One unresolved question is the seaward extent of the ocean usual and accustomed grounds of the Quileute, Hoh, and Quinault Tribes.[28]

By contrast, little litigation has occurred regarding the locations of "usual and accustomed places" in the Columbia Basin.[29] The federal government has set aside specific "in-lieu" treaty fishing sites along the Columbia River to substitute for traditional Indian fishing sites inundated by dams.[30] Washington and Oregon recognize the mainstem Columbia River from just above Bonneville Dam upstream to the Snake River mouth as an area where mid-Columbia treaty tribes are entitled to exercise treaty fishing rights.[31] The status of other places may be unclear, however.[32]

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[27] *United States v. Washington*, 384 F. Supp. 312, 359-81 (W.D. Wash. 1974) ("Boldt decision") (Hoh, Lummi, Makah, Muckleshoot, Nisqually, Puyallup, Quileute, Quinault, Sauk-Suiattle, Skokomish, Squaxin Island, Stillaguamish, Upper Skagit, Yakama), aff'd, 520 F.2d 676 (9th Cir. 1975), cert. denied, 423 U.S. 1086 (1976); United States v. Washington, 459 F. Supp. 1020, 1049, 1066-69 (W.D. Wash. (1975) (Lower Elwha, Nooksack, Suquamish, Swinomish, Makah, Stillaguamish); United States v. Washington, 626 F. Supp. 1405, 1441-43, 1470, 1486 (W.D. Wash. 1981-1984) (Nisqually, Puyallup, Squaxin Island, Jamestown S'Klallam, Port Gamble S'Klallam, Lower Elwha Klallam); United States v. Washington, 626 F. Supp. 1405, 1466-68 (W.D. Wash. 1982), aff'd, 730 F.2d 1314 (9th Cir. 1984) (Makah); United States v. Washington, 626 F. Supp. 1405, 1527-32 (W.D. Wash. 1985), aff'd, 841 F.2d 317 (9th Cir. 1988) (Tulalip); United States v. Suquamish Indian Tribe, 901 F.2d 772 (9th Cir. 1990) (Suquamish); United States v. Washington, 873 F. Supp. 1422, 1447-50 (W.D. Wash. 1994) (Yakama, Upper Skagit), aff'd, 157 F.3d 630 (9th Cir. 1998), cert. denied, 526 U.S. 1060 (1999); Muckleshoot Tribe v. Lummi Indian Tribe, 141 F.3d 1355 (9th Cir. 1998) (Swinomish, Lummi); Muckleshoot Indian Tribe v. Lummi Indian Nation, 234 F.3d 1099 (9th Cir. 2000) (Lummi); United States v. Muckleshoot Indian Tribe, 235 F.3d 429 (9th Cir. 2000) (Muckleshoot), cert. denied, 534 U.S. 950 (2001); United States v. Lummi Indian Tribe, 235 F.3d 443 (9th Cir. 2000) (Lummi); see also United States v. McGowan, 62 F.2d 955 (9th Cir.) (Quinault and Quileute Tribes do not have usual and accustomed fishing stations in Columbia River estuary), aff'd mem., 290 U.S. 592 (1933).

[28] *See Midwater Trawlers Co-operative v. Dep't of Commerce*, 282 F.3d 710, 716 (9th Cir. 2002).

[29] In *State v. James*, 72 Wn.2d 746, 435 P.2d 521 (1967), the court determined that the Columbia River between Bonneville Dam and the Bridge of the Gods is a usual and accustomed place of the Yakama Nation. The court in the Yakima Basin water adjudication has determined the usual and accustomed places of the Yakama Nation along the Yakima, Naches, and Tieton Rivers. *Washington Dep't of Ecology v. Acquavella*, No. 77-2-01484-5, Report of the Court Concerning the Water Rights for the Yakima Indian Nation 79-80 (Yakima Cy. Super. Ct. Nov. 13, 1995).

[30] *See* 25 C.F.R. Parts 247, 248, *Sohappy v. Hodel*, 911 F.2d 1312 (9th Cir. 1990).

[31] *See* WAC 220-22-010(6), (7), (8) (defining fishing areas); WAC 220-32-050(2)(a) (Indian commercial fishing areas); WAC 220-32-055 & OAR 635-041-0015 (Indian subsistence fishing areas); OAR 635-041-0005 (Indian fishing areas). This area is sometimes called "Zone 6." *See* OAR 635-042-0001.

- **The Treaties Secure Physical Access to "Usual and Accustomed" Places, but Not "Open and Unclaimed Lands," Over Private Property**

The right of taking fish at usual and accustomed places preserves to the Indians an easement in land to get to and use traditional fishing places for taking fish and the associated activities mentioned in the treaties. Settlers acquired the land subject to the Indians' preexisting treaty rights.[33] The easement may be conditioned to protect landowners.[34] The treaty-secured easement of access to usual and accustomed fishing grounds and stations is a property right for which just compensation must be paid if taken.[35]

- **The Treaties Preempt State Power to Regulate the Exercise of Treaty Fishing Rights Except Where "Necessary for Conservation"**

The State may regulate the exercise of off-reservation treaty fishing and hunting rights where reasonable and necessary for the conservation of fish or game.[36] "Conservation" means "perpetuation of the species."[37] "'[R]easonable' means that a specifically identified conservation measure is appropriate to its purpose; and 'necessary' means

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[32] In 1942, the United States Department of the Interior prepared a comprehensive *Report on Source, Nature and Extent of the Fishing, Hunting and Miscellaneous Related Rights of Certain Indian Tribes in Washington and Oregon, Together With Affidavits Showing Locations of a Number of Usual and Accustomed Fishing Grounds and Stations*. It is sometimes called the "Swindell Report," after Edward G. Swindell, the lead investigator. The "Swindell Report" has been used as an exhibit in *U.S. v. Washington* and other cases. *See Whitefoot v. United States*, 293 F.2d 658, 665 (Ct. Cl. 1961), *cert. denied*, 369 U.S. 818 (1962); *Confederated Tribes of the Umatilla Indian Reservation v. Alexander*, 440 F. Supp. 553, 555 (D. Or. 1977); *State v. Moses*, 79 Wn.2d 104, 124, 483 P.2d 832 (1971) (Finley, J., dissenting) (describing Swindell report as a "definitive study"), *cert. denied*, 406 U.S. 910 (1972). A copy is available from the Washington State Library.

[33] *United States v. Winans*, 198 U.S. 371 (1905); *United States v. Taylor*, 3 Wash. Terr. 88, 13 P. 333 (1887), *enforced*, 44 F. 2 (C.C.D. Wash. 1890); *United States v. Washington*, 157 F.3d 630, 646-47 (9th Cir. 1998) (shellfish on private tidelands), *cert. denied*, 526 U.S. 1060 (1999).

[34] *United States v. Winans*, 198 U.S. 371, 384 (1905); *United States v. Washington*, 157 F.3d 630, 654 (9th Cir. 1998), *cert. denied*, 526 U.S. 1060 (1999).

[35] *Muckleshoot Indian Tribe v. Hall*, 698 F. Supp. 1504, 1510, 1516 (W.D. Wash. 1988); *see Nw. Sea Farms v. U.S. Army Corps of Engineers*, 931 F Supp. 1515, 1521 (W.D. Wash. 1996).

[36] *Tulee v. Washington*, 315 U.S. 681, 684 (1942) (fishing); *Antoine v. Washington*, 420 U.S. 194, 207 (1977) (hunting—Colville); *State v. Miller*, 102 Wn.2d 678, 686-88, 689 P.2d 81, 86 (1984) (hunting).

[37] *United States v. Washington*, 384 F. Supp. 312, 333 (W.D. Wash. 1974), *aff'd*, 520 F.2d 676 (1975), *cert. denied*, 423 U.S. 1086 (1976); *see id.* at 342, 415.

that such purpose in addition to being reasonable must be essential to conservation."[38] To be "reasonable and necessary for conservation," a regulation "must, when considered in the context of the total regulatory plan, be designed to preserve or maintain the resource."[39] State regulations that place a disproportionate conservation burden on treaty Indian fishing are discriminatory and therefore preempted by the treaties. State regulations must also meet appropriate procedural standards.[40] The treaties preempt state regulation of treaty fishing and hunting that is not "necessary for conservation."[41] "As part of his 1974 injunction, Judge Boldt enjoined the State from imposing salmon and steelhead conservation closures on Tribes judged to be self-regulating. At this time, three tribes are officially recognized as self-regulating in Washington: Quinault, Quileute, and Yakama.[42]

Laws prohibiting sale of fish generally are not "reasonable and necessary for conservation" (unless the tribe in question has a similar prohibition). The treaty right of taking fish includes the right to sell the fish.[43]

General public safety laws that are not specific to hunting or fishing can be enforced against Indians exercising off-reservation treaty rights.[44] The state may also be able to

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[38] *U.S. v. Washington*, 384 F. Supp. at 342; *see United States v. Oregon*, 657 F.2d 1009, 1012, 1017 (9th Cir. 1982) (upholding order enjoining Yakama fisheries on spring chinook); *Dep't of Game v. Puyallup Tribe, Inc.*, 86 Wash.2d 664, 667, 685, 548 P.2d 1058, 1063, 1072 (1976), *aff'd*, 433 U.S. 165, 177 (1977) (fishing regulation was necessary for conservation).

[39] *U.S. v. Washington*, 384 F. Supp. at 402 (CL 30).

[40] *E.g.*, *Puyallup Tribe v. Washington Game Dep't (Puyallup III)*, 433 U.S. 165, 177 (1977) (regulations allocating 45% of harvestable steelhead run to tribal fishery met "conservation necessity" standards), *aff'g* 86 Wn.2d 664, 548 P.2d 1058 (1976); *Antoine v. Washington*, 420 U.S. 194, 207 (1977); *Wash. Game Dep't v. Puyallup Tribe* (*Puyallup II*), 414 U.S. 44, 48 (1973) (regulation banning Indian gear was discriminatory toward Indians); *Puyallup Tribe v. Wash. Dep't of Game* (*Puyallup I*), 391 U.S. 392, 399 (1968); *Makah Indian Tribe v. Schoettler*, 192 F.2d 224 (9th Cir. 1951); *United States v. Washington*, 384 F. Supp. 312, 342, 402-04, 416, 417 (W.D. Wash. 1974) (CL 31, 32, 35, 42, Inj. ¶¶ 12, 19), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976); *Sohappy v. Smith*, 302 F. Supp. 899, 907-12 (D. Or. 1969); *cf. State v. Squally*, 78 Wn.2d 475, 474 P.2d 897 (1970).

[41] *United States v. Washington*, 520 F.2d 676, 684-86 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976); *Purse Seine Vessel Owners Ass'n v. State*, 92 Wn. App. 381, 392, 966 P.2d 928, 934 (1998), *review denied*, 137 Wn.2d 1030, 980 P.2d 1284 (1999).

[42] *United States v. Washington, 384 F.Supp at 414*.

[43] *U.S. v. Washington*, 384 F. Supp. at 343 n.29; *see id* at 418 (Inj. ¶ 21).

[44] *State v. Olney*, 117 Wn. App. 524, 72 P.3d 235 (2003) (RCW 77.15.460, which prohibits possession of a loaded firearm in a motor vehicle, is a general safety law, not a hunting regulation, and can be enforced against Yakama Indians exercising treaty hunting rights), *review denied*, 151

apply health and safety regulations for fishing and hunting to Indians exercising treaty rights where the regulations do not otherwise impede the exercise of the right.[45] In the case of treaty shellfishing in Washington, the parties worked out a consent decree addressing food safety regulation.[46]

Where state license fees are involved, the treaties preempt state law to a somewhat greater extent than they preempt state laws regulating the time, place, and manner of fishing: The treaty right of taking fish preempts state fishing license fees where such fees are "not indispensable to the effectiveness of a state conservation program."[47]

In Western Washington, licensing of vessels used in treaty fisheries is governed by a consent decree.[48] In general, Tribes license their members' vessels.

- *The Treaties Secure a Right to a "Fair Share" of Fish: United States v. Oregon and United States v. Washington*

By the late 1960s, the demand for salmon had outstripped the supply in the Pacific Northwest. Tribal fisheries were at a disadvantage because of their location. Non-Indian fisheries in marine areas and in the lower Columbia River intercepted salmon migrating to spawning grounds before the salmon reached tribal usual and accustomed

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Wn.2d 1004, 87 P.3d 1185 (2004); *see Mescalero Apache Tribe v. Jones*, 411 U.S. 145, 148-49 (1973) ("Absent express federal law to the contrary, Indians going beyond reservation boundaries have generally been held subject to nondiscriminatory state law otherwise applicable to all citizens of the State.").

[45] *Lac Courte Oreilles Band of Lake Superior Chippewa Indians v. Wisconsin*, 740 F. Supp. 1400, 1423 (W.D. Wis. 1990); *Lac Courte Oreilles Band of Lake Superior Chippewa Indians v. Wisconsin*, 668 F. Supp. 1233, 1238-39 (W.D. Wis. 1987); *State v. Matthews*, 248 Wis.2d 78, 81, 635 N.W.2d 601, 602-03 (Wis. Ct. App. 2001); *see State v. Big John*, 146 Wis. 741, 751-52, 432 N.W.2d 576 (1988); *but see State v. Lemieux*, 110 Wis. 2d 158, 327 N.W.2d 669 (1983) (loaded-firearm law was an impermissible regulation of Indian hunting).

[46] *United States v. Washington*, No. 70-9213 Phase I, Subproceeding No. 89-3, *Consent Decree Regarding Shellfish Sanitation Issues* (W.D. Wash. May 4, 1994). *See* WAC ch. 246-282. The State had contended in the shellfish case that "commercial disposition of shellfish by the plaintiff tribes and their members is subject to reasonable, nondiscriminatory regulation by the state, under the exercise of the state's police power in the interest of protecting human health, safety and welfare." *United States v. Washington*, No C70-9213, Subproceeding 89-3, Pretrial Order at 11 (W.D. Wash. May 4, 1994). The issue was not litigated because the parties agreed to the Shellfish Sanitation consent decree.

[47] *Tulee v. Washington*, 315 U.S. 681, 685 (1942), *rev'g* 7 Wn.2d 124, 109 P.2d 280 (1941); *cf. Cree v. Flores*, 157 F.3d 762 (9th Cir. 1998) (Yakama Treaty preempts state truck license fees).

[48] *United States v. Washington*, No. 9213-Phase I, Subproceeding No. 88-1, *Consent Decree* (W.D. Wash. Nov. 28, 1994). Implementing rules appear at WAC 308-93-700 through 308-93-770.

fishing places upstream.[49] By the time the salmon reached tribal fisheries, few remained, and state regulators often sought to restrict tribal fishing to conserve the runs. The situation led the United States to sue the State of Oregon on behalf of four Columbia River treaty tribes in 1968. The United States contended that the treaties required Oregon to allow a fair share of the runs to pass upstream to tribal fisheries. The court agreed, and declared that Oregon must regulate its fisheries so as to pass a "fair share" of fish to tribal fishing places.[50] Washington, which shares authority with Oregon over Columbia River fisheries, downstream of the Wallula Gap, intervened in the case in 1974 and became bound by the decision.

In 1970, the United States filed a similar lawsuit against the State of Washington concerning fisheries on salmon runs from most of the watersheds in western Washington. In 1974, the court issued the "Boldt decision," holding that, under the treaties, the Tribes and non-Indians are each entitled to a fair share of fish.[51] The court rejected the Tribes' interpretation that the treaties entitled them to as many fish as they needed for a livelihood. The United States Supreme Court upheld the "fair share" interpretation in 1979.[52]

In crafting an equitable remedy, Judge Boldt decided that equal shares of the harvestable salmon available in Washington and closely adjacent marine waters from each run that passed through tribal fishing grounds would be "fair." Though altering some of the details, the Supreme Court approved this as a fair division.[53]

Seven weeks after the "Boldt decision," the court in the Oregon case amended its 1969 judgment, concluding that equal shares of harvestable salmon destined for tribal fishing places were "fair" for Columbia River fisheries, as well.[54] The 1969 *Sohappy* decree assumed that the geographic area within which treaty and non-treaty fisheries fairly share the harvest—the area within which catches "count" for harvest allocation—is the mainstem Columbia River between its mouth and McNary Dam. The court's Order of

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[49] *See United States v. Washington*, 384 F. Supp. 312, 411 (W.D. Wash. 1974).

[50] *Sohappy v. Smith*, 302 F. Supp. 899, 911 (D. Or. 1969). *See generally* John C. Gartland, *Sohappy v. Smith: Eight Years of Litigation Over Indian Fishing Rights*, 56 OR L. REV. 680 (1977).

[51] *United States v. Washington*, 384 F. Supp. 312, 401 (W.D. Wash. 1974) ("Boldt decision"), *aff'd*, 520 F.2d 676 (9th Cir. 1975), *cert. denied*, 423 U.S. 1086 (1976).

[52] *Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 684-85 (1979).

[53] 384 F. Supp. at 343-44, 416; *Fishing Vessel*, 443 U.S. at 685-89.

[54] *United States v. Oregon*, Order Amending Judgment of October 10, 1969 (May 10, 1974), *aff'd & remanded*, 529 F.2d 570, 573-74 (9th Cir. 1976).

August 20, 1975 extended the area downstream to include non-Indian catches in the ocean off Oregon and Washington as well.

Fifty percent of the harvestable fish remains the presumptive "fair share" absent equitable factors suggesting another division.[55] Hatchery fish are included in the allocation of "fair shares." The rationale is that hatchery fish replace fish lost to habitat degradation caused by dams and development.[56]

The treaties secure a right to take any species of fish found at usual and accustomed places, including species to which Indians did not have access at the time the treaties were executed.[57]

4.3.2 Endangered Species Act (ESA)

The listing of four steelhead distinct populations segments (DPSs) in Washington State under the Endangered Species Act has added additional complexity to steelhead management. The Endangered Species Act of 1973, as amended, 16 U.S.C 1531 *et seq.* (ESA) provides broad protection for fish, wildlife, and plant species that are listed as threatened or endangered, and the conservation of the ecosystems on which they depend. Responsibility for implementing the ESA is shared by the U.S. Fish and Wildlife Service (USFWS)(for terrestrial and freshwater species) and NMFS (for most marine mammals and anadromous fish). The ESA provides for the conservation of species which have been so depleted in numbers that they are in danger of or threatened with extinction throughout all or a significant portion of their range. "Species" is defined

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[55] *See Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 685 (1979); *Puyallup Tribe v. Wash. Dep't of Game (Puyallup III)*, 433 U.S. 165, 177 (1977); *United States v. Washington*, 157 F.2d 630, 631 (9th Cir. 1998), *cert. denied*, 526 U.S. 1060 (1999) (shellfish). It is not correct to say that the Tribes have a treaty right to half the fish, or that the phrase "in common with" in the treaties means half. The legal right that the treaties secure is a right to a fair share of fish. The equitable remedy that the courts have ordered to implement that right is half the harvestable fish within a defined geographic area. The court may modify the remedy should circumstances change or the equities dictate. *Fishing Vessel*, 443 U.S. at 686-88; *see United States v. Washington*, 157 F.3d 630, 652-53 (9th Cir. 1998) (Tribes not entitled to 50% of shellfish growers' production); *United States v. Washington*, Civil No. 9213-Phase I, Subproceedings 83-6/90-1, *Order Re: Status Conference* (W.D. Wash. May 2, 1996) (whether geographic area of 50/50 sharing should be extended to Alaska involves issue of whether "there are changed circumstances that might require an adjustment or modification of Judge Boldt's decision").

[56] *United States v. Washington*, 759 F.2d 1353, 1358-60 (9th Cir. 1985) (*en banc*), *cert. denied*, 474 U.S. 994 (1985).

[57] *United States v. Washington*, 157 F.2d 630, 643-44 (9th Cir. 1998), *cert. denied*, 526 U.S. 1060 (1999) (shellfish).

the ESA as a species, a subspecies, or for vertebrates only, a distinct population segment (DPS). NMFS has determined that a Pacific salmon or steelhead stock will be considered a distinct population segment, and hence a "species" under the ESA, if it represents an evolutionarily significant unit (ESU) of the biological species. A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

Section 4 of the ESA prohibits the consideration of economic impacts in making species listing decisions. NMFS is required to make a listing decision based solely on the best scientific and commercial data available. However, under section 4, NMFS must consider economic impacts when designating critical habitat necessary for the continued survival of the species. After a species is listed, a recovery plan is prepared which identifies conservation measures to help the species recover.

Section 4(d) of the ESA requires the Secretary to adopt those regulations he deems necessary for the conservation of the species. Fishing activities which are conducted in compliance with a resource management plans approved by NMFS are exempt from take prohibitions on listed species. Section 7 of the ESA outlines the procedures for Federal interagency cooperation to conserve listed species and designated critical habitat, and requires all Federal agencies to consult with NMFS (or USFWS) concerning the potential effects of their actions on any listed species. Section 7(a)(1) requires federal agencies to conserve endangered and threatened species. Section 7(a)(2) requires federal agencies to ensure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize endangered or threatened species, or result in the destruction or adverse modification of designated critical habitat. The determination that NMFS must make on the resource management plan constitutes a federal action and so requires consultation under section 7 of the Act.

If a proposed action is "likely to adversely affect" a listed species or its critical habitat, then formal consultation under section 7(a)(2) must be undertaken. Formal consultation concludes with NMFS' issuing a biological opinion. If the biological opinion concludes that the proposed action is likely to "jeopardize" the continued existence of the listed species or result in the destruction or adverse modification of designated critical habitat, then NMFS may develop reasonable and prudent alternatives in order to avoid these outcomes.

Current ESA-listing determinations for Washington steelhead are summarized below:

Threatened: Snake River, Upper Columbia River, Middle Columbia River, and Lower Columbia River
Petitioned: Puget Sound

WDFW must apply for, and receive authorization from NOAA Fisheries for the incidental and direct "take" of listed steelhead ESUs associated with fisheries, artificial propagation, and research programs. Authorization may take several forms, including section 4(d), 7, or 10 permits.

4.3.3 Washington State Statutes

The mandate of the Washington Department of Fish and Wildlife is defined in RCW 77.04.012:

> "The department shall conserve the wildlife and food fish, game fish, and shellfish resources in a manner that does not impair the resource. In a manner consistent with this goal, the department shall seek to maintain the economic well-being and stability of the fishing industry in the state. The department shall promote orderly fisheries and shall enhance and improve recreational and commercial fishing in this state."

Two key state statutes provide policy sideboards for the management of non-Indian steelhead fisheries. Steelhead are classified as a game fish in RCW 77.08.020 and RCW 77.12.760 states that "Steelhead trout shall be managed solely as a recreational fishery for non-Indian fishermen under the rule-setting authority of the fish and wildlife commission."

The Fish and Wildlife Commission is provided the authority in RCW 77.12.047 to establish seasons, open waters, allowable gear types, and other management controls:

> "(1) The commission may adopt, amend, or repeal rules as follows:
> (a) Specifying the times when the taking of wildlife, fish, or shellfish is lawful or unlawful.
> (b) Specifying the areas and waters in which the taking and possession of wildlife, fish, or shellfish is lawful or unlawful.
> (c) Specifying and defining the gear, appliances, or other equipment and methods that may be used to take wildlife, fish, or shellfish, and specifying the times, places, and manner in which the equipment may be used or possessed.
> (d) Regulating the importation, transportation, possession, disposal, landing, and sale of wildlife, fish, shellfish, or seaweed within the state, whether acquired within or without the state.
> (e) Regulating the prevention and suppression of diseases and pests affecting wildlife, fish, or shellfish.

(f) Regulating the size, sex, species, and quantities of wildlife, fish, or shellfish that may be taken, possessed, sold, or disposed of.
(g) Specifying the statistical and biological reports required from fishers, dealers, boathouses, or processors of wildlife, fish, or shellfish.
(h) Classifying species of marine and freshwater life as food fish or shellfish.
(i) Classifying the species of wildlife, fish, and shellfish that may be used for purposes other than human consumption.
(j) Regulating the taking, sale, possession, and distribution of wildlife, fish, shellfish, or deleterious exotic wildlife.
(k) Establishing game reserves and closed areas where hunting for wild animals or wild birds may be prohibited.
(l) Regulating the harvesting of fish, shellfish, and wildlife in the federal exclusive economic zone by vessels or individuals registered or licensed under the laws of this state.
(m) Authorizing issuance of permits to release, plant, or place fish or shellfish in state waters.
(n) Governing the possession of fish, shellfish, or wildlife so that the size, species, or sex can be determined visually in the field or while being transported.
(o) Other rules necessary to carry out this title and the purposes and duties of the department.

(2) Subsections (1)(a), (b), (c), (d), and (f) of this section do not apply to private tideland owners and lessees and the immediate family members of the owners or lessees of state tidelands, when they take or possess oysters, clams, cockles, borers, or mussels, excluding razor clams, produced on their own private tidelands or their leased state tidelands for personal use. "Immediate family member" for the purposes of this section means a spouse, brother, sister, grandparent, parent, child, or grandchild.

(3) Except for subsection (1)(g) of this section, this section does not apply to private sector cultured aquatic products as defined in RCW 15.85.020 Subsection (1)(g) of this section does apply to such products."

Several other relevant state statutes are summarized below.

RCW 77.12.010. Limitation on prohibiting fishing with bait or artificial lures. The commission shall not adopt rules that categorically prohibit fishing with bait or artificial lures in streams, rivers, beaver ponds, and lakes except that the commission may adopt rules and regulations restricting fishing methods upon a determination by the director that an individual body of water or part thereof clearly requires a fishing method

prohibition to conserve or enhance the fisheries resource or to provide selected fishing alternatives.

RCW 77.12.043. Contracts and agreements for propagation of fish or shellfish. (1) The director may enter into contracts and agreements with a person to secure fish or shellfish or for the construction, operation, and maintenance of facilities for the propagation of fish or shellfish. (2) The director may enter into contracts and agreements to procure from private aquaculturists fish or shellfish with which to stock state waters.

RCW 77.12.045 Territorial authority of commission -- Adoption of federal regulations and rules of fisheries commissions and compacts. Consistent with federal law, the commission's authority extends to all areas and waters within the territorial boundaries of the state, to the offshore waters, and to the concurrent waters of the Columbia river. Consistent with federal law, the commission's authority extends to fishing in offshore waters by residents of this state. The commission may adopt rules consistent with the regulations adopted by the United States department of commerce for the offshore waters. The commission may adopt rules consistent with the recommendations or regulations of the Pacific marine fisheries commission, Columbia river compact, the Pacific salmon commission as provided in chapter 77.75 RCW, or the international Pacific halibut commission.

RCW 77.12.459. Release and recapture of salmon or steelhead prohibited. A person other than the United States, an Indian tribe recognized as such by the federal government, the state, a subdivision of the state, or a municipal corporation or an agency of such a unit of government shall not release salmon or steelhead trout into the public waters of the state and subsequently to recapture and commercially harvest such salmon or trout. This section shall not prevent any person from rearing salmon or steelhead trout in pens or in a confined area under circumstances where the salmon or steelhead trout are confined and never permitted to swim freely in open water.

Mitigation agreements exist that legally define operations for many hatchery programs in Washington. One example is the Lower Snake River Compensation Plan, a congressionally authorized mitigation program that is intended to compensate for natural production lost as a result of the construction of dams in the Snake River basin.

4.4 Trends in Fishery Catch and Effort

4.4.1 Catch of Steelhead

Encounters, catch, and total mortality must be carefully defined when reporting harvest statistics for steelhead. We will consistently use the definitions of the ASFEC (1995):

> Encounters. The number of fish that initially encountered the gear. A fish that is encountered may either drop-off prior to landing, be released after being brought to the fisher, or retained as catch.
>
> Catch. The number of fish retained by the fisher.
>
> Total Mortality. The number of fish retained by the fisher plus the fish that were encountered that subsequently died as a result of drop-off or the catch-and-release process.

The total catch of steelhead in Washington has fluctuated substantially (Fig. 4-1). Catches exceeded 250,000 fish in the 1992-1993 season before declining to a low of approximately 100,000 fish in the 1997-1998 season. Catches subsequently increased, reaching almost 250,000 fish in the 2001-2002 season. Catch by tribal fishers declined from approximately 108,000 in the 1992-1993 season to less than 37,000 in the 2003-2004 season.

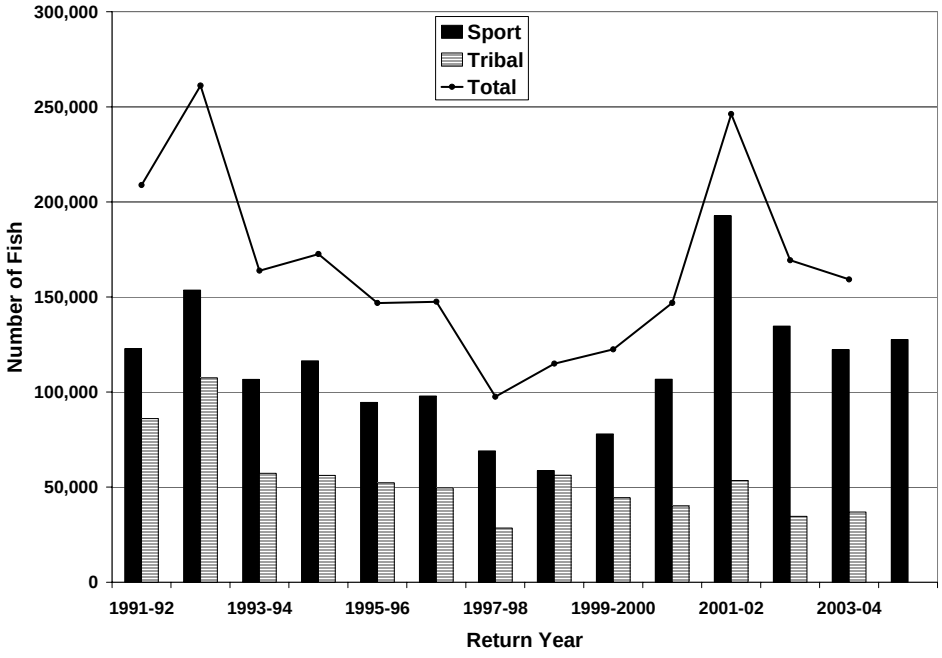

Figure 4-1. Total catch of steelhead in Washington by tribal and sport fishers.

Increases in the sport catch of steelhead in by sport fishers subsequent to the 1997-1998 season occurred primarily in the Columbia River basin (Fig. 4-2). Catches in the Columbia River basin increased from approximately 33,000 in the 1998-1999 season to over 138,000 in the 2001-2002 season. Catches in the other two areas (Washington Coast and Strait of Juan de Fuca-Puget Sound) also increased in the 2001-2002 season to approximately 27,000 fish.

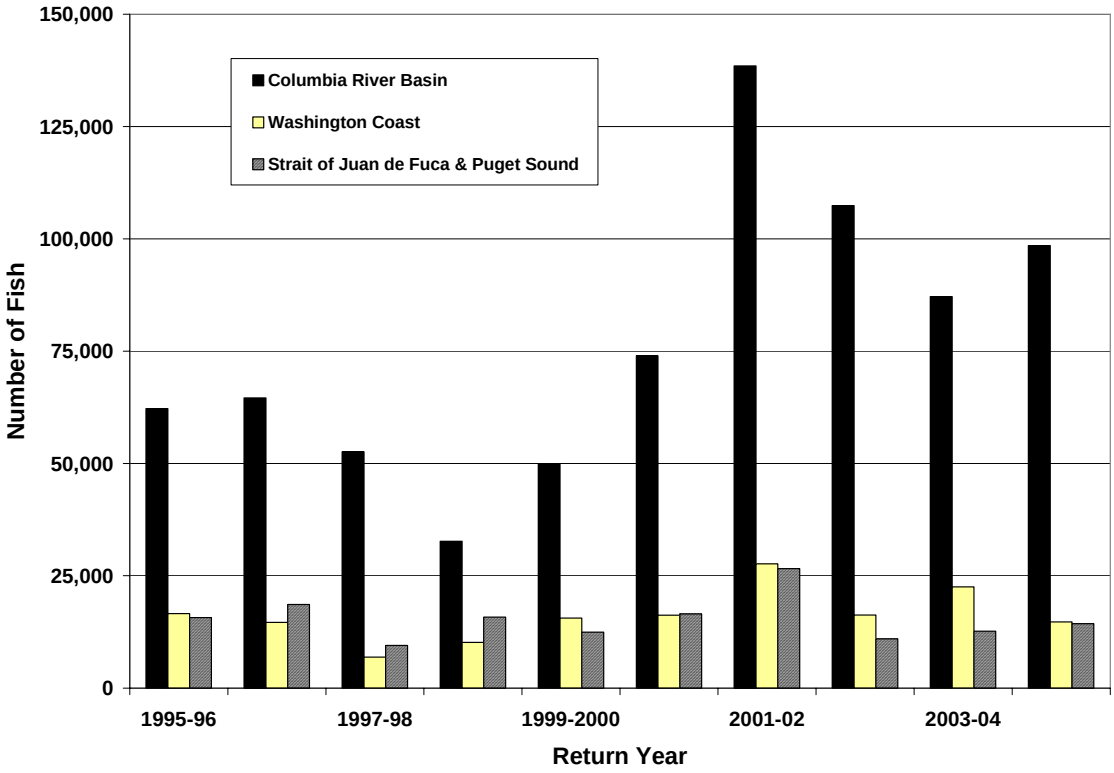

Figure 4-2. Catch of steelhead by sport fishers in the Columbia River basin, rivers along the Washington Coast, and rivers along the Strait of Juan de Fuca and Puget Sound.

A longer time series of catch of steelhead by sport fishers suggests a 7-8 year cycle has been repeated since the 1974-1975 season (Fig. 4-3). Low points in the cycle occurred in the 1975-1976 (68,806 steelhead), 1982-1983 (96,091 steelhead), 1990-1991 (85,509 steelhead), and 1998-1999 (58,675 steelhead) seasons. Variations in sport catch can reflect many factors, including the abundance of steelhead (see Chapter 7), the catchability of steelhead as affected by conditions such as stream flow, and fishing regulations. Since the 1986-1987 seasons, the catch of natural-origin steelhead has declined from approximately 40,000 fish to less than 5,000 fish (Fig. 4-3). Reductions in the catch of natural-origin steelhead have resulted from several factors, including increasingly restrictive regulations that required the release of natural-origin steelhead.

4.4.2 Angler Participation

The number of anglers and average number of days fishing for steelhead in Washington was estimated in four surveys conducted from 1965 through 2003 (WDG 1965; Mongillo and Hahn 1988; WDFW 1996; Michael 2004). The surveys indicate that both the number of Washington residents fishing for steelhead and the average number of days fished increased through the 1994-1995 fishing season (Table 4-2). The average number of days fished per angler increased from 10.8 in the 1964 survey to 20.7 in the 1995 survey; the estimate number of steelhead anglers increased from 133,000 to 212,002 during the same time period. The total fishing effort for the 1994-1995 season was 4.4 million angler-days. However, the estimated number of anglers participating, and the average number of days fished per angler, declined in the 2002-2003 steelhead season relative to the 1994-1995 season. The result was a 28% decline in participation in the steelhead sport fishery to 3.1 million angler-days.

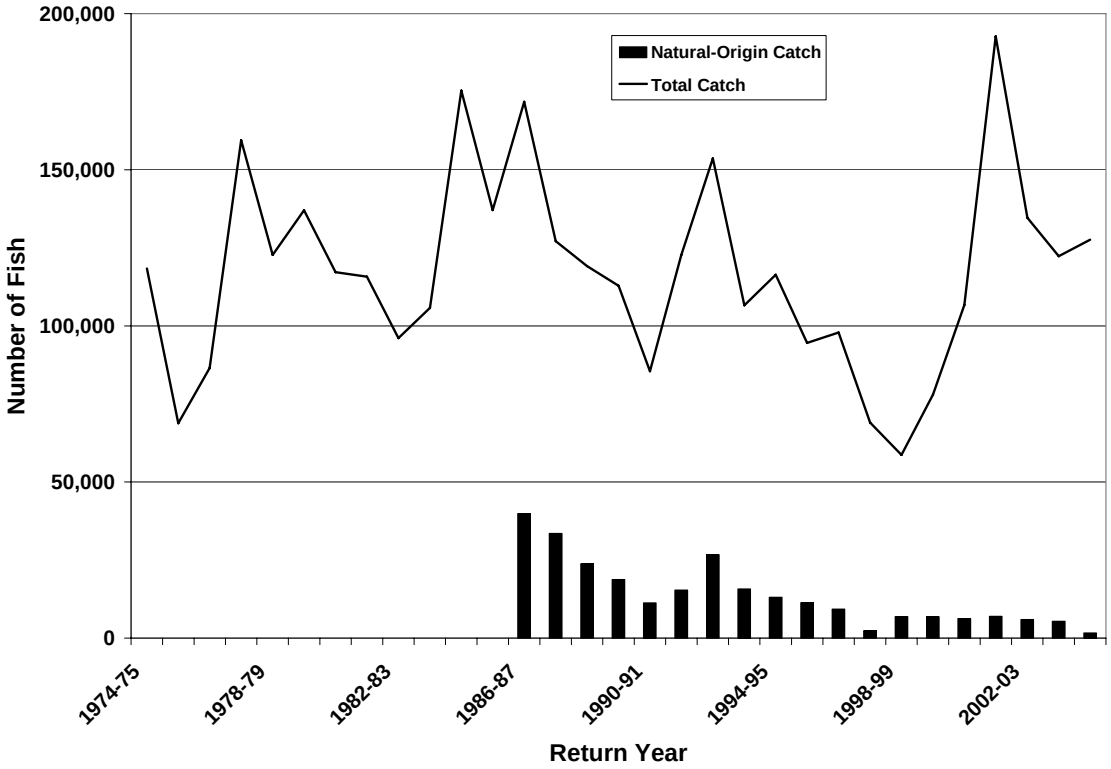

Figure 4-3. Catch of natural-origin steelhead and the total catch of steelhead in Washington by sport fishers.

Table 4-2. Average days fished for steelhead, number of anglers, and angler-days for residents of Washington who fished for steelhead for at least one day.

Fishing Year	Days per angler (95% CI)	Anglers	Angler-Days
January 1, 1964 through December 31, 1964	10.8 (NA)	133,000	1,436,100
January 1, 1986 through December 31, 1986	15.9 (NA)	178,325	2,895,900
May 1, 1994 through April 30,1995	20.7 (19.1, 22.3)	212,002	4,388,436
April 1, 2002 through March 31, 2003	18.3 (15.6, 21.0)	172,064	3,148,278

A second measure of trends in participation in the steelhead sport fishery is available from the number of catch record cards (CRCs) issued for steelhead. The CRC program was initiated for the 1948-1949 fishing season to estimate the sport catch of winter steelhead. Modifications in the program have occurred since that time, including extension of catch reporting for the summer season (1962 season), charging a fee for the card (1970 season), and combination of the CRC and fishing license for multiple species (1999-2000 season)(see Box 4-1 for additional information on the steelhead CRC). To improve the comparability of the CRC data for the years before and after the initiation of a CRC fee, only the CRCs for anglers who indicated that they fished for steelhead were used for years prior to the 1970 season. Even with this correction, the number of steelhead CRCs should be considered only an approximate indicator of angler participation in the steelhead fishery because of the many factors affecting CRC usage. The combination of multiple species on a single CRC or license precludes comparison of data collected subsequent to the 1998-1999 season and previous years.

The CRC data suggest that participation in the sport fishery for steelhead increased rapidly from the late-1940s until the mid-1970s (Fig. 4-4). Beginning with an average of approximately 45,000 steelhead CRC, the number issued increased to an average of 152,587 issued per year for the 1971-1975 time period. The number of steelhead CRC issued declined steadily in subsequent years, averaging only 86,898 for the 1995-1996 through 1998-1999 fishing seasons.

Box 4-1. Reporting of Sport and Tribal Catch of Steelhead

Catch record cards (CRCs) have been used in Washington since 1948 to estimate the sport catch of steelhead. Anglers are required to obtain a CRC prior to fishing for steelhead, to record the number and location of fish caught, and return the card at the end of the season. Substantial changes have occurred in the CRC program since its inception. Major events in the development of the CRC program are summarized below:

1948 – Free CRC required for anglers fishing for steelhead from December 1948 through April 1949
1962 – Catch reporting requirement extended to include entire year.
1970 – Fee charged for license and CRC (juveniles, elders, and some other special cases excluded).
1974 - Bias correction applied to account for non-response bias (anglers who do not turn in a CRC are less likely to catch as many steelhead as anglers who turn in the CRC).
1975- CRC reporting period changed from calendar year to fishing season. 1975 CRC reported catch for January 1, 1975 through April 30, 1976. 1976 CRC and subsequent years reported catch for the period of May 1 through April 30 of the subsequent year.
1984 - Fee charged for license and CRC for anglers of any age.
1986 - Catch of marked (clipped adipose or ventral fin) and unmarked steelhead recorded.
1999- Steelhead license eliminated.
2000- Multi-specie CRC (e.g., steelhead, salmon, halibut) initiated.
2001- Washington Interactive Licensing Database (WILD) implemented to issue fishing licenses and CRCs and electronically capture angler information.

Each steelhead caught is assigned to either the summer run or winter run depending upon the date of catch. Steelhead caught from May through October are defined as summer run; steelhead caught from November through April are defined as winter run with exception of steelhead caught above Bonneville Dam. All steelhead caught above Bonneville Dam are assumed to be summer steelhead.

Catches of steelhead in tribal fisheries are recorded on fish tickets that are typically completed by fish buyers at the time the catch is sold or by tribal fishery management staff. The fish ticket includes information on the date of the landing, the fishing area where the fish were caught, the type of gear used to catch the fish, the tribal affiliation of the fisher, the number of fish caught, and the total weight of the fish caught.

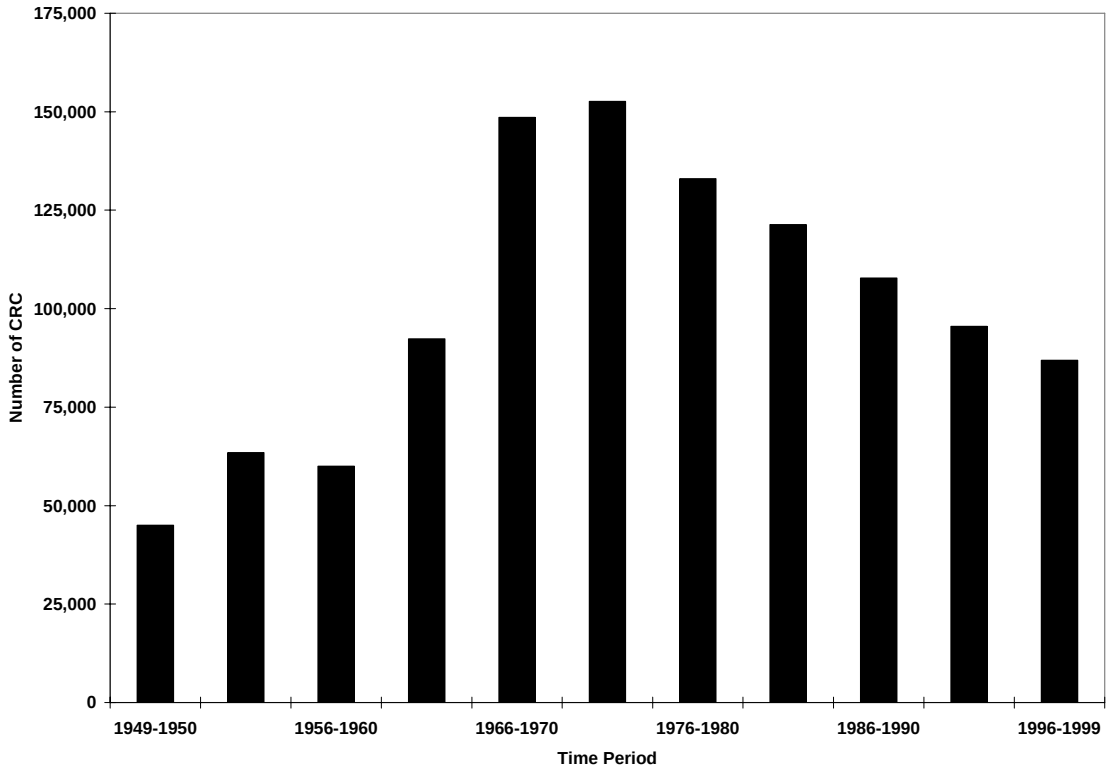

Figure 4-4. Average number of steelhead CRC for 5-year periods from the initiation of the program for the 1948-1949 fishing season through the 1998-1999 fishing season.

4.5 Recreational Angler Surveys

The stewardship responsibility of WDWF requires that recognition and balancing of the interests and values of a wide variety of Washington State residents. One group of residents that WDFW has surveyed repeatedly is comprised of fishers who have obtained a CRC or freshwater fishing license. WDFW conducted five surveys of recreational anglers who obtained a CRC or freshwater fishing license in Washington from 1986 through 2002 (Table 4-3). Results from those surveys are summarized below; additional information may be found in the reports by Mongillo and Hahn (1988), WDFW (1996), and Michael (2004).

Table 4-3. Surveys of Washington anglers conducted from 1987 through 2002.

Survey Name	Survey Type	Sample Frame	Sample Size	Source
1987	Mail	Residents of Washington issued a freshwater fishing license for the 1986 season.	3,438	Mongillo and Hahn (1988)
1995 General	Telephone	Anglers issued a freshwater fishing license for the May 1994 through April 1995 season.	1,522	WDFW (1996)
1995 Steelhead	Telephone	Anglers issued a steelhead catch record card for the May 1994 through April 1995 season.	1,042	WDFW unpublished data.
2001	Telephone	Anglers issued a fishing license for the May 2000 through April 2001 season.	2,143	WDFW unpublished data.
2003	Telephone	Anglers issued a combination (valid in freshwater and saltwater areas) or freshwater fishing licenses for the April 2002 through March 2003 season.	1,541	Michael (2004)

Catch and Release Fisheries

Angler preferences regarding catch and release fisheries were evaluated in both the 1995 Steelhead and 2001 surveys. In the 1995 Steelhead survey, anglers were asked the following question:

> "Imagine a river that does not have enough wild steelhead to meet spawning requirements, but does have enough hatchery steelhead to meet hatchery spawning requirements.
>
> Which of the following three regulations would you favor for this river?
>
> 1) Close all steelhead fishing to allow maximum protection of the wild steelhead (close);
> 2) Allow catch-and-keep fishing for hatchery fish but require all wild, or unmarked, fish to be released (hatchery retention with wild steelhead release); or
> 3) Catch and release for both wild and hatchery steelhead (catch and release hatchery and wild)."

Of the anglers interviewed, 75.2% supported hatchery retention with wild steelhead release, 15.8% supported catch and release of hatchery and wild, 8.4% supported a closure, and 0.6% had no opinion.

The question regarding catch and release was modified in the 2001 survey to include three variations in the status of the natural-origin steelhead.

> "Question 34. First, consider a river that has more wild steelhead than are needed to meet spawning requirements and also has more hatchery steelhead than are needed to meet hatchery needs
>
> Question 35. Now consider a river with a wild steelhead run size that is close to but below spawning requirements, but does have enough hatchery steelhead to meet hatchery needs. Which sport fishing regulations would you prefer for this river?
>
> Question 36. Now consider a river with a wild steelhead run size that is far below spawning requirements, but again, does have enough hatchery steelhead to meet hatchery needs. Which sport fishing regulations would you prefer for this river?"

The anglers interviewed were then asked to identify the preferred fishing regulations from among the following choices:

1) Allow harvest of both wild and hatchery steelhead (hatchery and wild retention);
2) Catch-and-release all wild and all hatchery steelhead (catch-and-release hatchery and wild);
3) Hatchery fish may be kept, but all wild steelhead must be released (hatchery retention, wild-steelhead-release); or
4) Close all fishing for steelhead (close).

In general, the anglers interviewed favored more restrictive regulations as the abundance of the wild population declined (Table 4-4). Anglers supporting a closure increased from 1.9% to 29.1% as the status of the wild population declined from above goal to far below goal, while those supporting retention of both the hatchery and wild population declined from 33.9% to 5.4%. Perhaps more interesting is that 60% of the anglers surveyed supported the release of wild fish (sum of regulation options 2 and 3) even when the wild population was more abundant than the escapement goal.

Table 4-4. Results from 2001 angler survey regarding preferred regulations when the wild population is either above, slightly below, or far below the escapement goal.

Preferred Regulation	Wild Population Status		
	Above Goal	Slightly Below Goal	Far Below Goal
1) Hatchery and Wild Retention	33.9%	9.5%	5.4%
2) Hatchery Retention, Wild-Steelhead-Release	49.3%	59.0%	41.4%
3) Catch-and-Release Hatchery and Wild	11.5%	17.6%	20.9%
4) Close all Fishing	1.9%	10.3%	29.1%
5) No Opinion	3.4%	3.5%	3.2%

Gear Preferences

Recreational anglers have been asked about the type of gear they preferred to use when fishing for summer and winter steelhead. In the 1995 General and 2003 surveys, the anglers were asked to identify the primary choice of gear among the following options: 1) bait; 2) lure with bait; 3) lure; or 4) fly. In both years, approximately 9% of the anglers interviewed identified that fly fishing was their primary choice of gear (Fig. 4-5). However, the number of anglers selecting lures declined from 41% in the 1995 General survey to 28% in 2003. Increases occurred in percentage of anglers identifying bait and lure with bait as the primary gear type.

The other surveys conducted by WDFW included only three gear categories (bait with or without lure, lure, and fly), but they do provide a longer time period for evaluation of trends in the selection of fishing gear (Fig. 4-6). Results from the surveys indicate that the use of lures has been trending downward since the 1987 survey, while the use of flies as the primary gear choice has stayed constant at about 9 percent.

Fishing gear preferences for summer steelhead and winter steelhead were similar in the 2003 survey (Fig. 4-7). Usage of lures and flies was slightly higher for the anglers surveyed who fished for summer steelhead than for anglers who fished for winter steelhead.

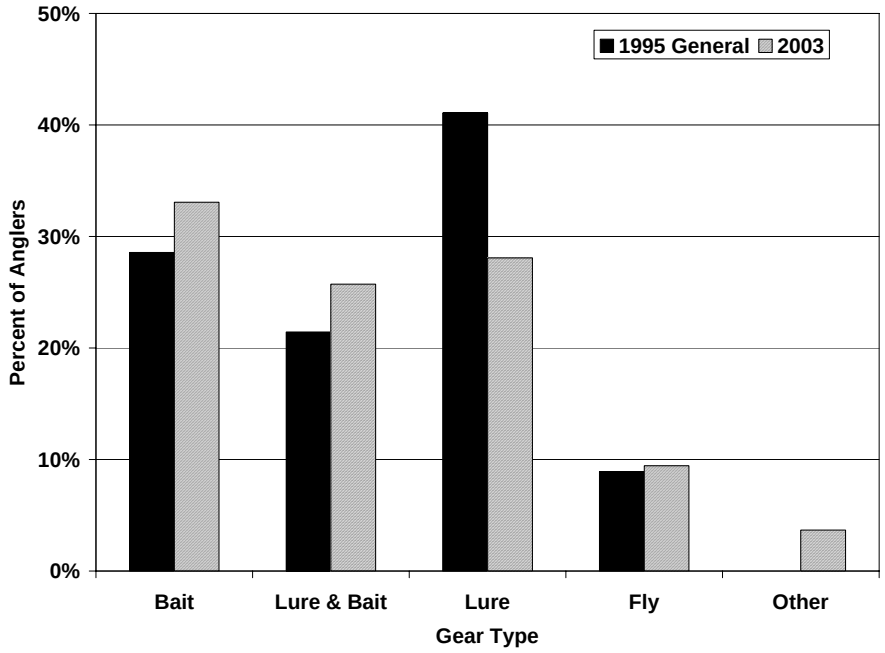

Figure 4-5. Preferred gear for steelhead anglers interviewed in the 1995 General and 2003 surveys.

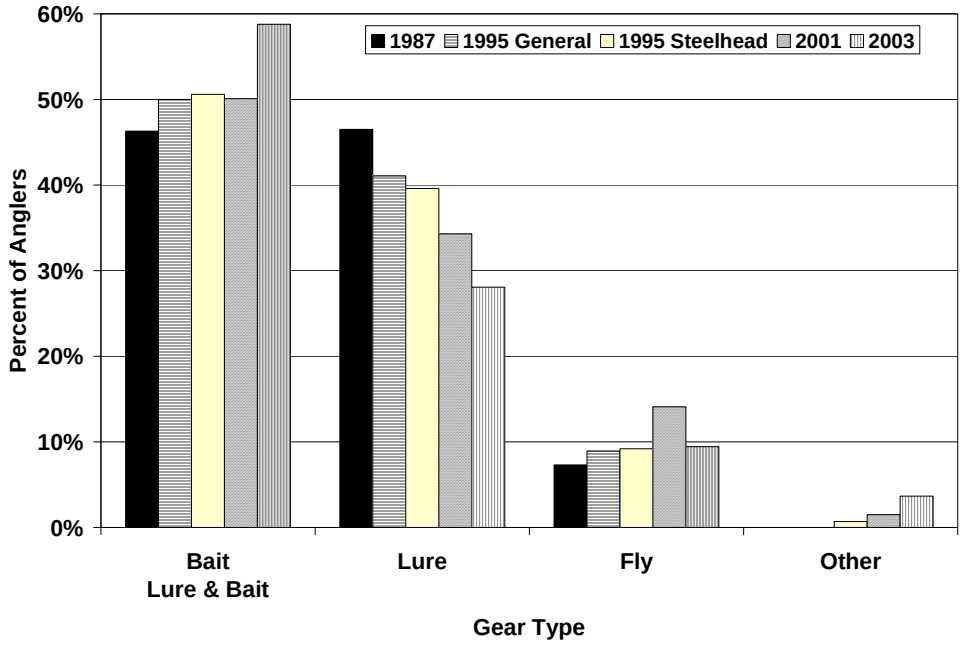

Figure 4-6. Preferred gear of steelhead anglers in the 1987, 1995 General, 1995 Steelhead, 2001, and 2003 surveys.

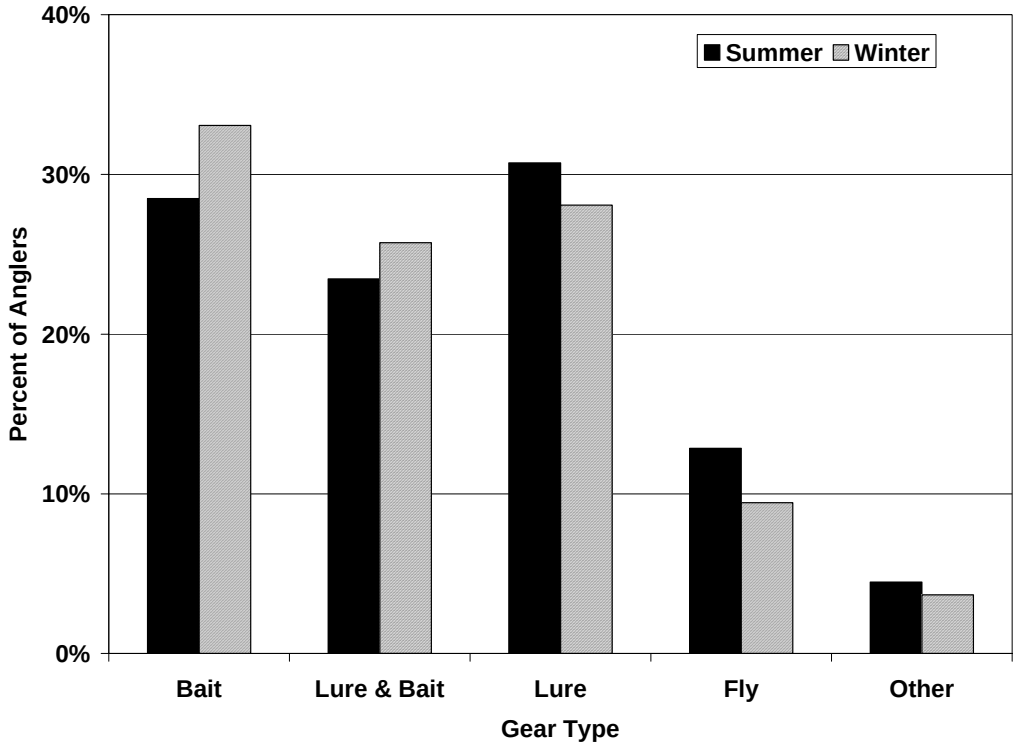

Figure 4-7. Preferred gear of anglers fishing for summer steelhead or winter steelhead in the 2003 survey.

Voluntary Catch-and Release

The 1987, 1995 General, and the 2003 surveys asked anglers a question similar to the following: "What percent of the steelhead that you catch, and are legal to keep, do you voluntarily release?"

The surveys indicate that anglers are becoming more likely to release steelhead that legally can be retained (Fig. 4-8). In the 1987 survey, anglers surveyed indicated that an average of 14% of the steelhead landed were released; this increased to 40% in the 1995 General survey, and 42% in the 2003 survey. The 2003 survey provided additional information on differences in release rates for summer and winter steelhead. The anglers interviewed indicated that they released an average of 40% of the winter steelhead and 44% of the summer steelhead landed that could legally be retained. However, a substantial percentage of anglers interviewed in the 2003 survey did not release any steelhead that could legally be retained (20% of summer steelhead anglers; 14% of winter steelhead anglers).

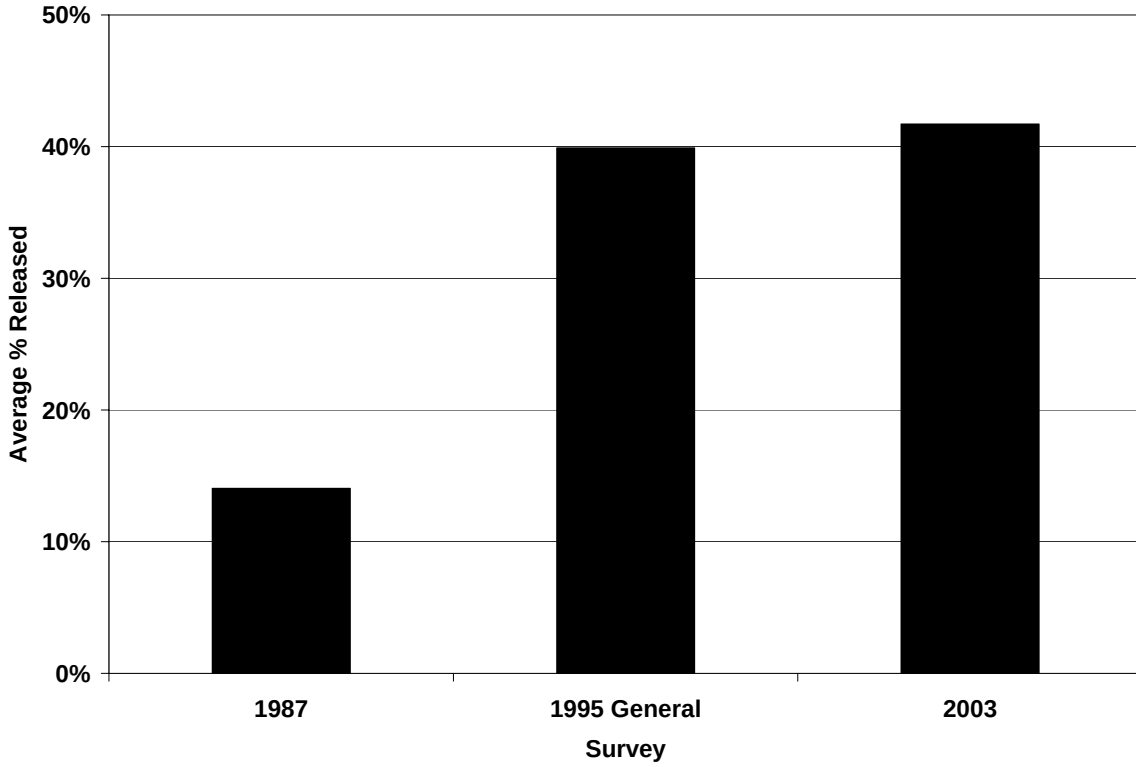

Figure 4-8. Average percent of steelhead released that could legally be retained for anglers interviewed in the 1987, 1995 General, and 2003 surveys.

4.6 Management Trade-offs

Fisheries can potentially pose risks at the population, species, and ecosystem level (see reviews by Law 2000; Tittensor et al. in press). Fishery harvest rates that are too high can reduce species abundance to levels below those consistent with maximizing catch, recreational opportunities, or economic benefits (i.e., California sardine, Peruvian anchoveta, and North Sea herring fisheries) and, particularly in conjunction with other factors such as habitat degradation, can increase the risk of the extirpation of a population. While the potential effects of fisheries on abundance have traditionally been the focus of fishery management, spatial structure and diversity have received increasing attention in recent assessments. Changes in spatial structure and diversity, while sometimes subtle, can be equally important in reducing the potential productivity and viability of populations (Conover and Munch 2002; Berkeley et al. 2004; Olsen et al. 2004). More broadly, fisheries have the potential to substantially alter the structure and functional relationships of ecosystems (Pauly et al. 2001; Ward and Meyers 2005). The magnitude of the risks posed by a steelhead fishery will depend on how, when, and

where the fishery is implemented, the biological characteristics of the steelhead in the fishery, and the ecosystem context in which the fishery occurs.

Walters and Martell (2004) suggest that the central problem of fisheries decision-making is evaluating the trade-offs between these risks (and others) and the cultural and economic benefits of fisheries over both the short- and long-term. Their insightful book, *Fisheries Ecology and Management*, provides several examples that we have adapted and expanded upon for Washington steelhead:

1) Short-term vs. Long-term Benefits. A higher level of harvest in the shortterm can mean a reduced level of harvest in the future. Conversely, the reduction or elimination of fisheries can result in the loss of communities or cultural values.
2) Spatial Structure and Diversity vs. Harvest Level. A higher level of harvest in a fishery comprised of multiple populations (or subpopulations) can result in a loss of spatial structure or diversity at the population (or subpopulation) level.
3) Ecological Function vs. Economic Value. The harvest of economically valuable species can result in a reduction in the abundance of other species that depend on the harvested species for food or as a source of marine derived nutrients.
4) Selective vs. Nonselective Fisheries. Fishing gear or regulations that facilitate reductions in the harvest of depressed species or populations may be expensive to implement, preclude the participation of some fishers, or result in the loss of traditional cultural practices.
5) Artificial vs. Natural Production. Artificial production programs can provide additional fishing opportunities but may reduce the diversity, spatial structure, productivity, or abundance of natural populations.
6) Funding of Stock Assessment vs. Artificial Production. Investment in artificial production programs may increase fish abundance, but a reduction in stock assessment may result in a loss in fishing opportunities or place populations at risk of overfishing.

Trade-offs between performance measures can be represented graphically by plotting the pairs of performance measures values that could be achieved under various management approaches (Fig. 4-9). The shape of the relationship between the performance measures is informative. A concave relationship indicates that a small increase in performance measure X will result in a disproportionate reduction in performance measure Y. Concave relationships are difficult from both a policy and a technical perspective. From a policy perspective, identifying a satisfactory solution may be difficult because a relatively small increase in one performance measure can only be obtained by a substantial loss in the other performance measure. Results from

the analysis are likely to be sensitive to the choice of models and parameter values and, because the policy trade-off is a difficult one, technical analyses are likely to be closely scrutinized. Although tradeoffs may also be difficult if a convex relationship exists, finding an acceptable compromise will generally be easier because increasing the value of one performance measure results in a relatively small decrease in the other performance measure.

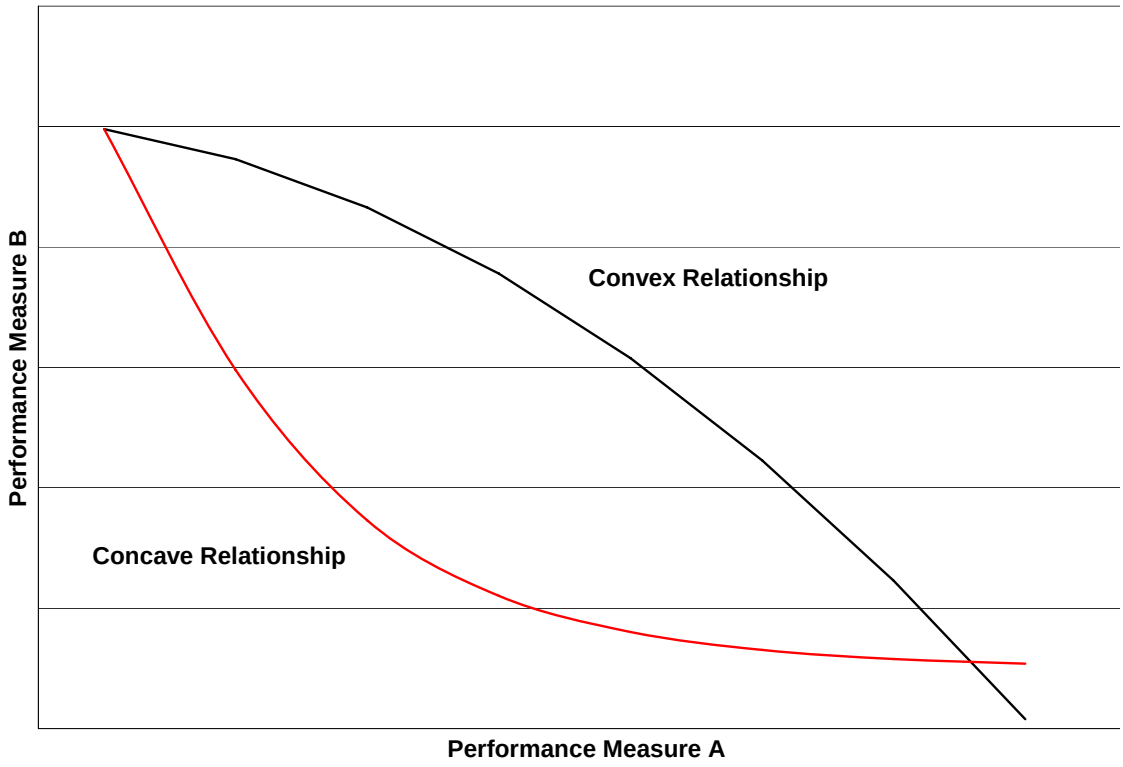

Figure 4-9. Form of concave and convex relationships illustrating trade-offs between performance measures A and B.

4.7 Watershed Management Strategies

A strategy describes the general approach that will guide harvest, hatchery, and habitat management actions implemented in the pursuit of a management goal. Strategies for habitat, harvest, and hatchery production, often referred to as the all-h sectors, have often been developed and evaluated in isolation. Optimal harvest strategies, for example, have been explored under a variety of conditions (Clark 1985), but rarely have interactions with habitat and artificial production strategies been considered. This development of sector-specific strategies has continued to occur despite the increasing recognition that the status of west coast salmonids depends on the aggregate effect of the habitat, harvest, and artificial production sectors.

In this section we will begin by briefly describing several common harvest and hatchery management strategies. We will then focus on two strategies often used in the management of salmonid populations, discuss their interaction with the quality and quantity of freshwater habitat, and illustrate trade-offs that are frequently encountered during implementation.

Three general harvest management strategies for anadromous salmonid populations have been the subject of extensive theoretical and practical evaluation: 1) constant catch; 2) constant harvest rate; or 3) constant escapement. Reviews of the extensive literature on these strategies are provided in Hilborn and Walters (1992) and Walters and Martell (2004).

A constant catch strategy is perhaps the easiest to implement and provides the greatest stability to fishers. Unfortunately it also places populations at the greatest risk of substantial and potentially irreversible declines in abundance. Reductions in abundance associated with environmental factors are accentuated by a constant catch strategy, potentially driving the population to economic extinction or extirpation.

Constant harvest rate strategies may be optimal when stakeholders are averse to large variations in catch (Deriso 1985) or for some mixed-stock fisheries (Hilborn 1985). This strategy is also likely to provide greater stability in terms of season length or catch to fishers than a constant escapement strategy. When longterm changes in the stock-recruit function occur, as has been observed for steelhead populations in several areas of Washington, analyses by Walters and Parma (1996) suggest that the optimal strategy is to: 1) maintain the same harvest rate if only the carrying capacity is changing; or 2) vary the harvest rate to track changes in the intrinsic productivity of the population.

Rigorous analysis of constant escapement strategies was initiated by Ricker (1958). Subsequent analyses have generally confirmed his conclusion that a constant escapement policy maximizes the average catch if: 1) the population is a single homogenous unit; 2) the population size at the start of fishing is known without error; and 3) the stock-recruit relation is stationary with independent annual variation in survival. In the presence of a longterm shift in the stock-recruit relation (e.g., decadal scale changes associated with the marine environment), the optimal strategy is to track these shifts by keeping the target escapement level near the most productive level (Walters and Martell 2004).

Two strategies for artificial production programs were discussed at length in the previous chapter. Briefly, the intent of an integrated strategy is that fish of natural- and hatchery-origin become fully reproductively integrated as a single population. This will always require that natural-origin adults are incorporated in the broodstock for the

hatchery program, and hatchery-origin adults may spawn in natural areas. The intent of an isolated program (called segregated in HSRG 2004) is for the hatchery population to represent a distinct population that is reproductively isolated from naturally-spawning populations.

The artificial production and harvest management strategies for steelhead populations in Washington can be broadly grouped into one of six categories (Table 4-5). It should be noted that harvest management strategies implemented for Washington steelhead populations are typically more complex than a constant escapement or constant harvest rate. For example, harvest rates for many Upper Columbia steelhead populations vary from 0% to 8% depending upon population abundance. Similarly, although the harvest management strategy for many Puget Sound populations is similar to a fixed escapement, in practice some harvest may occur even when the population abundance is slightly less than the escapement goal. Despite these simplifications, it is apparent that the majority of Washington steelhead populations are currently managed in one of three categories: 1) isolated artificial production and constant escapement; 2) isolated artificial production and constant harvest rate; and 3) integrated artificial production and constant harvest rate.

Table 4-5. Examples of artificial production and harvest management strategies for steelhead populations in Washington.

Artificial Production Strategy	Harvest Management Strategy	
	Constant Escapement	Constant Harvest Rate
No Artificial Production	Nisqually Winter	
Integrated		Upper Columbia populations such as Wenatchee, Methow, Okanogan
Isolated	Puget Sound populations such as Skagit Winter, Snohomish Winter	Lower Columbia populations such as Kalama Winter, Elochoman Winter.

The goal of the steelhead fishery comanagers is to protect, restore and enhance the diversity and long-term productivity of Washington's steelhead and their habitats in order to sustain ceremonial, subsistence, commercial and recreational fisheries and provide for associated cultural, economic and ecological benefits for the residents of Washington State. Our objective in the following section is to evaluate the general form of the trade-offs inherent in alternative strategies for achieving this goal. The evaluation relies primarily on a model that incorporates population dynamics for adults spawning in the hatchery and natural spawning areas (specify a and b parameters of a Beverton-Holt stock-recruit function), population fitness, and rules that prescribe the

artificial production and harvest management actions that will be taken under alternative resource conditions. We view the development of this model as an initial step toward the development of tools that can be used on a watershed-specific basis to inform policy decisions.

4.7.1 Integrated Hatchery Program, Constant Harvest Rate

An integrated hatchery program linked with a harvest rate management strategy is currently used in the management of steelhead populations in the Upper Columbia River (NMFS 2002; WDFW 2002). In general, this approach includes three primary components: 1) an integrated artificial production program implemented to reduce the risk of extinction of a natural population and/or increase harvest opportunities; 2) external marking of at least a portion of the hatchery-origin juveniles to facilitate harvest in a selective fishery; and 3) a maximum allowable harvest rate on returning adults. In the Upper Columbia plan, a stepped harvest rate schedule is linked to the abundance of natural-origin steelhead.

A watershed management strategy that incorporates these strategies for artificial production and harvest management is likely to encounter at least three fundamental trade-offs: 1) harvest level versus fitness of natural spawners; 2) harvest level versus number of natural spawners; and 3) harvest level versus spatial structure of population. Each of these trade-offs will also be affected by the quality and heterogeneity of the habitat.

Harvest Level vs. Fitness in Natural Environment; Vary Habitat Productivity

Case 1 simulated an integrated artificial production program linked with a constant harvest rate strategy. The artificial production program was set at twelve levels ranging from 0 to 1.59 million smolts. Adults of natural-origin were harvested at a rate of 20%; adults of hatchery-origin were harvested at a rate of 60%. Of the adults of hatchery-origin that were not harvested, 70% returned to the hatchery and 30% to natural spawning areas. Thirty percent of the broodstock used in the hatchery program was of natural-origin.

The proportionate natural influence (PNI) is a measure of the time the population spawns in the natural environment. Under the assumptions discussed in section 3.3.3, a PNI of more than 50% leads to a population with an equilibrium state with characteristics more like those of a pure natural population than a pure hatchery population. In Case 1, the average PNI over 25 generations decreased as the level of the artificial production program (and harvest mortality) increased (Fig. 4-10). This reduction in the PNI resulted from two factors. As the size of the artificial production program increased: 1) a greater proportion of the natural-origin adults were used for

hatchery broodstock relative to natural spawning; and 2)an increasing number of hatchery-origin adults were present in natural spawning areas.

A convex relationship existed between the average PNI and the level of harvest mortality, and the extent of nonlinearity increased as habitat quality decreased. The nonlinearity of this relationship has several important consequences. First, at a given level of habitat productivity, increases in the size of the artificial production program (and fishery harvest) will come at a disproportionate cost in a reduction in the PNI. Second, the increasing nonlinearity as habitat quality declines suggests that achieving both PNI and harvest objectives will become increasingly difficult as habitat quality declines.

The relative mean fitness of the population is also predicted to decline as the size of the artificial production program and fishery harvest increase (Fig. 4-11). With the parameters used in this scenario, the mean fitness of the population was reduced by approximately 9% under relatively good habitat conditions (a=7.0, b=6,000), and by approximately 21% under poor habitat conditions (a=1.75; b=1,500). As with the PNI, the form of the relationship became increasingly convex as habitat quality declined.

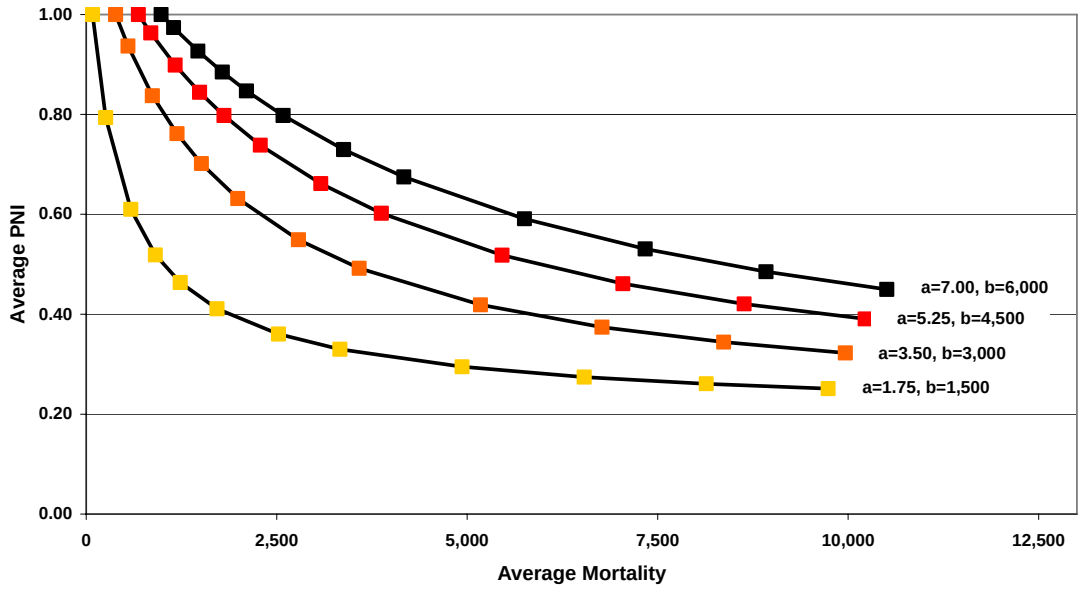

Figure 4-10. Relationship between fishery harvest mortality, PNI, and aquatic habitat productivity in Case 1.

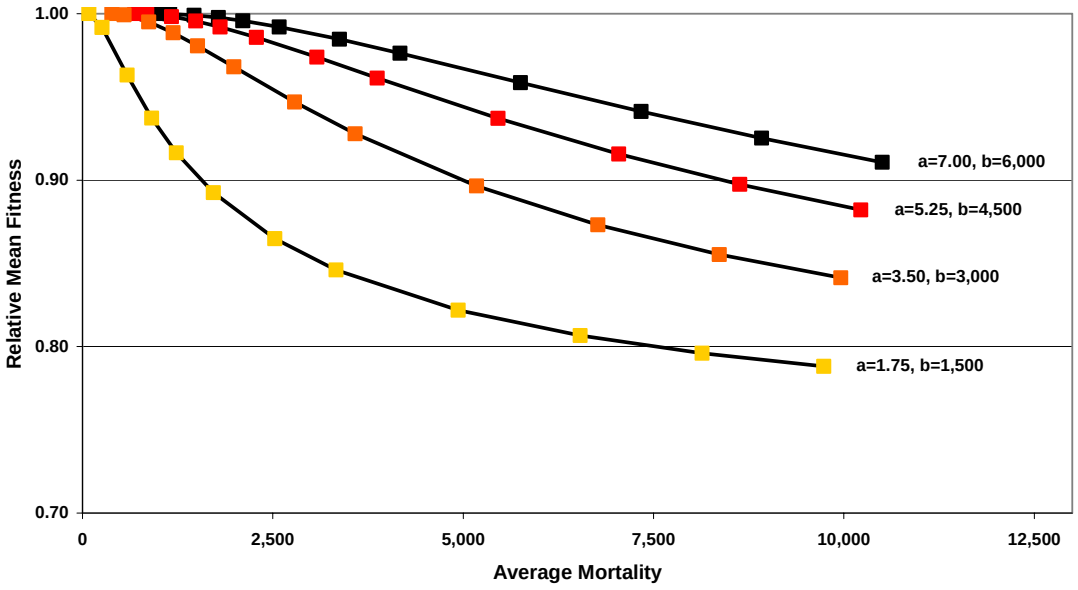

Figure 4-11. Relationship between fishery harvest mortality, relative mean fitness of the population, and habitat productivity in Case 1.

Harvest Level vs. Number of Spawners; Vary Habitat Productivity

In Case 1, the average fishing mortality and the number of natural spawners (natural- and hatchery-origin) increased as the size of the artificial production program increased (Fig. 4-12). The relationship was nearly linear since adults were fished at a constant harvest rate and a constant proportion of hatchery-origin adults returned to natural spawning areas. An upward-shift in the relationship occurred as habitat quality improved and an increasing number of natural-origin fish contributed to the harvest.

A slightly convex relationship existed in Case 1 between the number of natural-origin spawners and fishing mortality (Fig. 4-13). Under poor habitat conditions, the number of natural-origin spawners increased slightly when relatively small levels of artificial production programs were introduced in the simulations. This increase occurred because the combination of the stock-recruit parameters and fishery harvest rate modeled (20%) resulted in fewer natural-origin spawners than the equilibrium value. Initially, adding hatchery-origin spawners to the natural spawning areas increased the subsequent natural production. However, when the equilibrium value of spawners was achieved, additional increases in natural spawners did not result in an increase in production. Furthermore, as the size of the production increased further, the number of natural-origin spawners began to decline because of the reduction in the mean fitness of the population and the increased proportion of natural-origin used for the hatchery broodstock program.

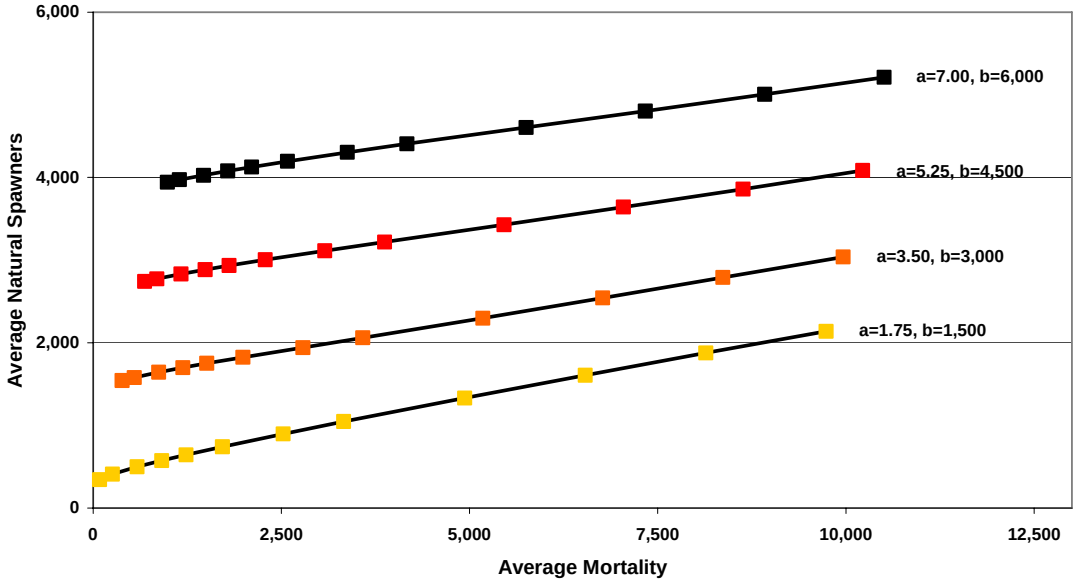

Figure 4-12. Relationship between fishery harvest mortality, natural spawners, and habitat quality in Case 1.

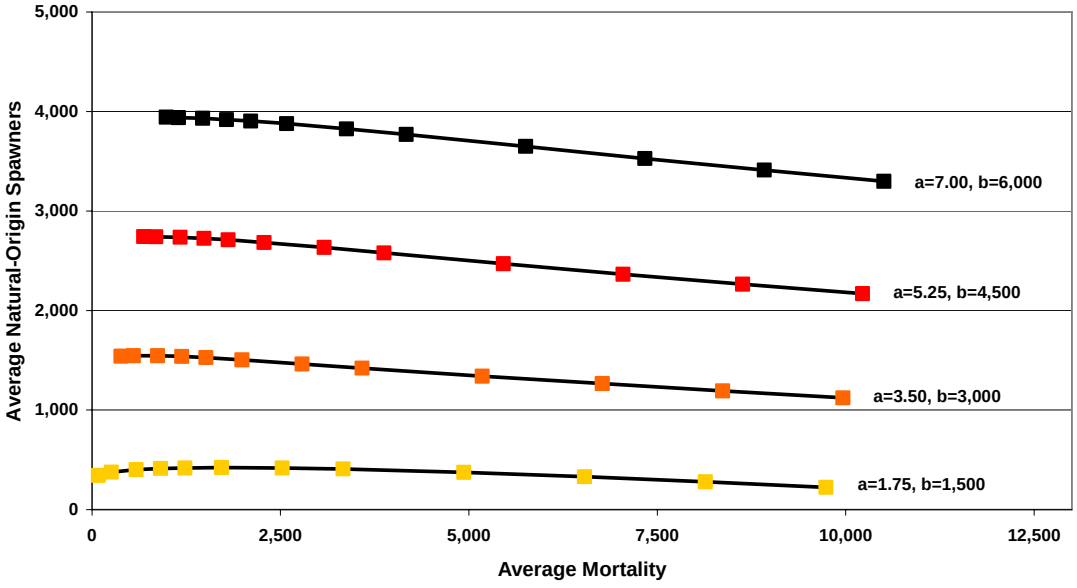

Figure 4-13. Relationship between fishery harvest mortality, natural-origin spawners, and habitat quality in Case 1.

Harvest Level vs. Number of Spawners; Vary Harvest Rate

The effect of the harvest rate was examined in Case 2 by varying harvest rates on natural-origin adults from 0.1 to 0.6. Harvest rates on adults produced from the artificial production program were set at 0.6 as in Case 1. Parameters for the stock-recruit function in the natural-environment were fixed at a=3.5 and b=3,000. All other parameters in the simulation were identical to Case 1.

Increasing the harvest rate on natural-origin adults reduces the number of natural-origin spawners for an integrated production program of a given size (Fig. 4-14). In addition, the nonlinearity of the relationship between natural-origin spawners and fishery mortality increased as the harvest rate increased. This response was similar to that which occurred when habitat quality was reduced in Case 1. In both cases, increases in the number of natural-origin spawners associated with the introduction of an artificial production program were greatest when the combination of the stock-recruit parameters and the harvest rate on natural-origin adults results in fewer natural-origin spawners than capacity.

The potential benefits of a lower harvest rate on natural-origin adults relative to hatchery-origin adults can also be evaluated in Fig. 4-14. A vertical line connecting points with equal levels of artificial production would indicate that there was no reduction in fishery harvest associated with an increasing number of natural-origin spawners. Although this does not occur under the conditions in this simulation, substantial increases in the number of natural-origin spawners could be achieved with relatively modest reductions in fishery harvest. For example, with an artificial production program of 266,000 smolts (dashed line in Fig. 4-14), reducing the harvest rate on natural-origin adults from 60% (non-selective harvest) to 10% resulted in a 23% reduction in fishery harvest but a 327% increase in the average number of natural-origin spawners.

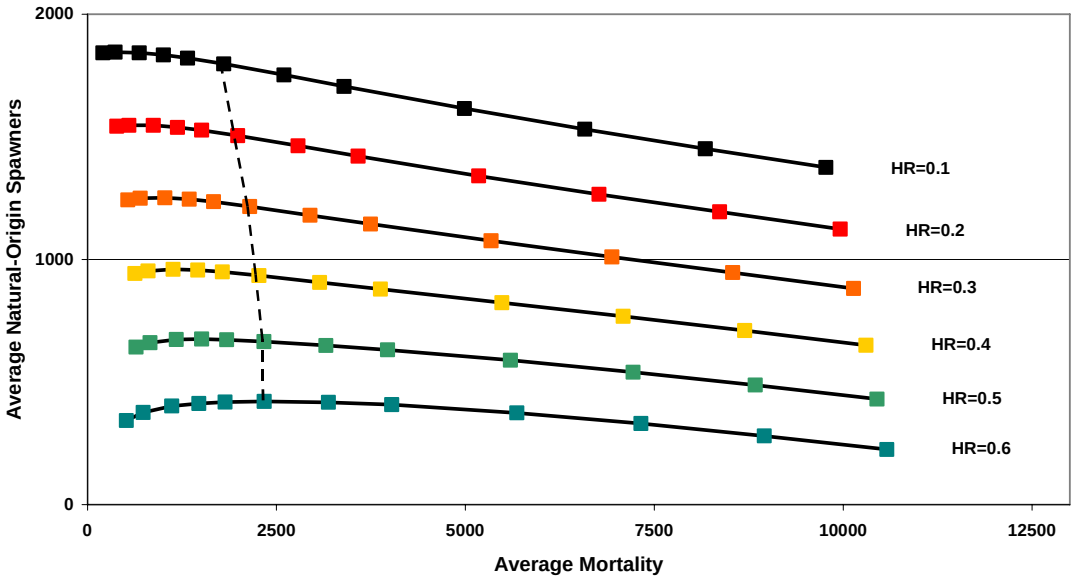

Figure 4-14. Relationship between fishery harvest mortality, natural-origin spawners, and harvest rate on natural-origin adults in Case 2. Dashed line indicates simulation results for artificial production program of 266,000 smolts at varying harvest rates on natural-origin adults.

Performance of Strategy if Hatchery Origin Spawners Controlled

The evaluation of the trade-offs for this strategy presented previously have all assumed that a fixed proportion of the hatchery-origin adults returned to natural spawning areas. If a weir or other structure allows sorting of spawners returning to the river, the performance of the strategy may be enhanced by controlling the proportion of natural- and hatchery-origin spawners in natural spawning areas. The benefits of controlling the number of hatchery-origin spawners can be evaluated relative to the funding and biological costs (e.g., potential delay of migration, handling mortality) that may occur if sorting of spawners is required. Under some conditions (small artificial production programs, low proportion of hatchery fish returning to natural spawning areas, productive natural habitat, low harvest rate on natural-origin adults), the additional costs of sorting may not be warranted.

An example is provided in Fig. 4-15 where simulation parameters are identical to Case 1 except the proportion of hatchery-origin adults returning to natural spawning areas is set at three levels (0.10, 0.30, 0.50). The performance of this strategy at the three rates is contrasted with a strategy in which a target PNI of 50% is established. Note that with an artificial production program of up to 186,000 smolts, the modeled PNI exceeds the target PNI because an insufficient number of hatchery-origin adults exists to meet hatchery broodstock requirements and assure that 30% of the natural spawners are of hatchery-origin. Assuring control of the PNI becomes increasingly important as the size of the program and the proportion of hatchery-origin adults returning to natural spawning areas increase.

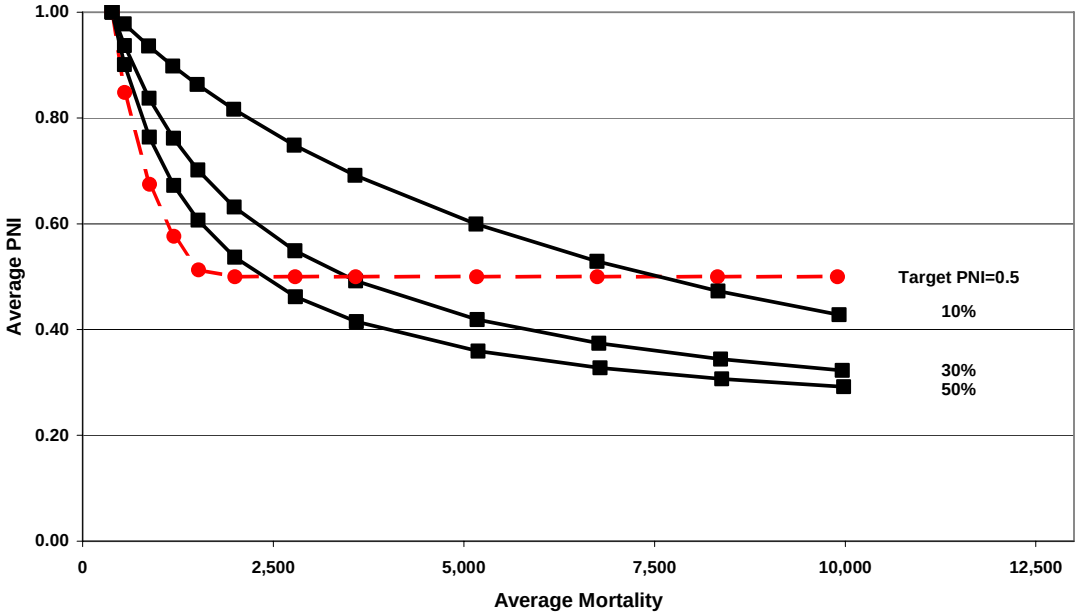

Figure 4-15. Relationship between fishery harvest mortality and PNI for varying rates of hatchery-origin adults to natural-spawning areas and when sorting to achieve a target PNI.

4.7.2 Isolated Hatchery Program, Constant Escapement Management

A strategy that links an isolated hatchery program and constant escapement management has been applied in many tributaries to the Lower Columbia River, the Washington coast, the Strait of Juan de Fuca, and Puget Sound. The key characteristics of this approach are: 1) an isolated artificial production program exists to increase harvest opportunities; 2) the juveniles released from the artificial production program are externally marked to provide for harvest in a selective fishery; 3) the allowable catch of natural-origin steelhead is constrained by the abundance of the natural run relative to the escapement goal. The methodology used to develop many of the escapement goals is described in Gibbons et al. (1985).

A watershed management strategy that incorporates these strategies for artificial production and harvest management is likely to encounter at least two fundamental trade-offs: 1) harvest level versus loss of diversity; and 2) harvest level versus fitness of natural spawners. Just as for the integrated artificial production and constant harvest rate strategy, the form of these relationships will be affected by the quality and heterogeneity of the habitat.

Harvest Level vs. Gene Flow; Vary Spawn Timing and Habitat Productivity

Case 3 simulated an isolated hatchery program linked with a constant escapement harvest management strategy. In the simulations, the fishery harvest was constrained so that the number of natural-origin adults spawning was equal to the level associated with the maximum sustainable harvest. Adults of hatchery-origin were harvested at a rate of 60%, and 70% of the remaining adults returned to natural spawning areas. Gene flow between the hatchery and natural-origin adults in natural spawning areas was modeled using the relationship presented in section 3.3.2 with spawn-timing overlap ranging from 0.01 to 0.20 for o_h and o_n. The artificial production program was set at the same twelve levels used in cases 1 and 2 (0 to 1.59 million smolts).

Gene flow from the adults produced from an isolated hatchery program to a natural population can affect population diversity and fitness. As discussed in Section 3.3.2, relatively low levels of gene flow can over multiple generations significantly reduce population diversity. For this reason, one conclusion of a 1995 workshop on hatchery programs operated with nonlocal broodstock was that there was "no genetic justification for allowing gene flow from non-native fish at levels as high as 5%" (NMFS 1997).

Increases in the fishery harvest level were associated with a substantial increase in gene flow under poor habitat conditions and the other conditions simulated in Case 1 (Fig. 4-16). Although increasing the extent of the spawn timing overlap of the hatchery and

natural-origin adults increased gene flow, the initial slope of the harvest-gene flow relationship is relatively high regardless of the degree of the overlap in spawn timing. Consequently, maintaining population diversity under poor habitat conditions is likely to be difficult with an isolated artificial production strategy and the conditions simulated even when the escapement of the natural stock is maintained at a level consistent with the maximum sustainable yield.

The trade-offs between the fishery harvest level and gene flow are less difficult under relatively good habitat conditions (Fig. 4-17). Under these conditions, the initial slope of the relationship is not as steep. However, even under good habitat conditions, gene flow was relatively insensitive to the overlap in spawn timing of the hatchery and natural-origin spawners. For example, at a artificial production level of 186,000 smolts, a twenty fold increase in the spawn-timing overlap (from $o_h=o_n= 0.01$ to $o_h=o_n= 0.20$) resulted in only a doubling of gene flow from 2.5% to 5%.

Harvest Level vs. Fitness; Vary Spawn Timing and Habitat Productivity

A concave relationship generally existed between the fishery harvest level and mean population fitness (Figs. 4-18 and 4-19). A greater degree of concavity was evident as habitat productivity declined and the extent of overlap in the spawn timing of hatchery and natural-origin adults increased. Particularly under poor habitat conditions, mean population fitness was also relatively insensitive to the degree of spawn timing overlap in hatchery and natural-origin spawners. Mean population fitness increased from 76% to 83% with a 20-fold increase in spawn timing overlap (from $o_h=o_n= 0.01$ to $o_h=o_n= 0.20$) at an artificial production level of 186,000 smolts.

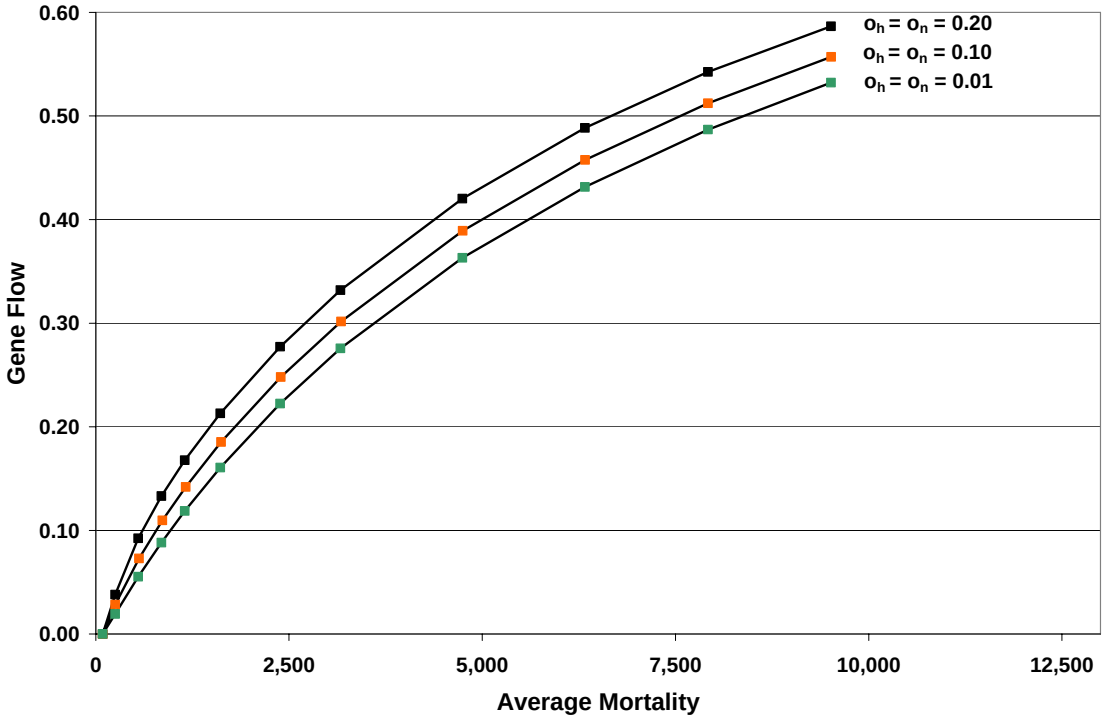

Figure 4-16. Relationship between gene flow and fishery harvest mortality for varying levels of spawn timing overlap and poor habitat productivity (a=1.75; b=1,500).

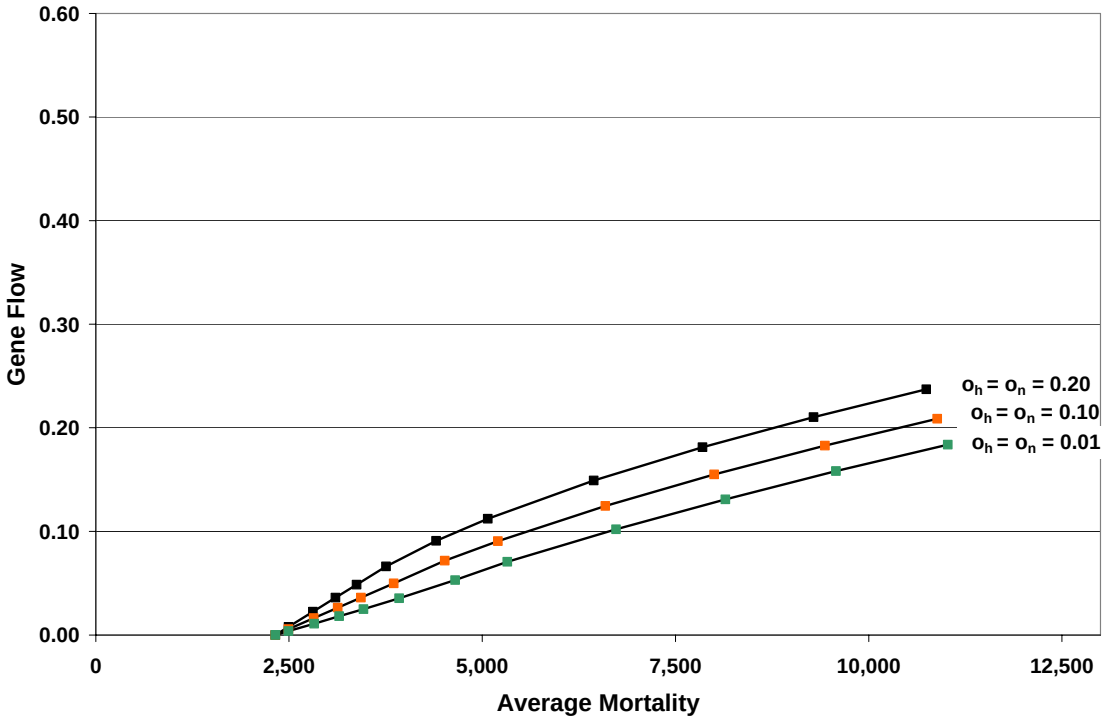

Figure 4-17. Relationship between gene flow and fishery harvest mortality for varying levels of spawn timing overlap and good habitat productivity (a=7.00; b=6,000).

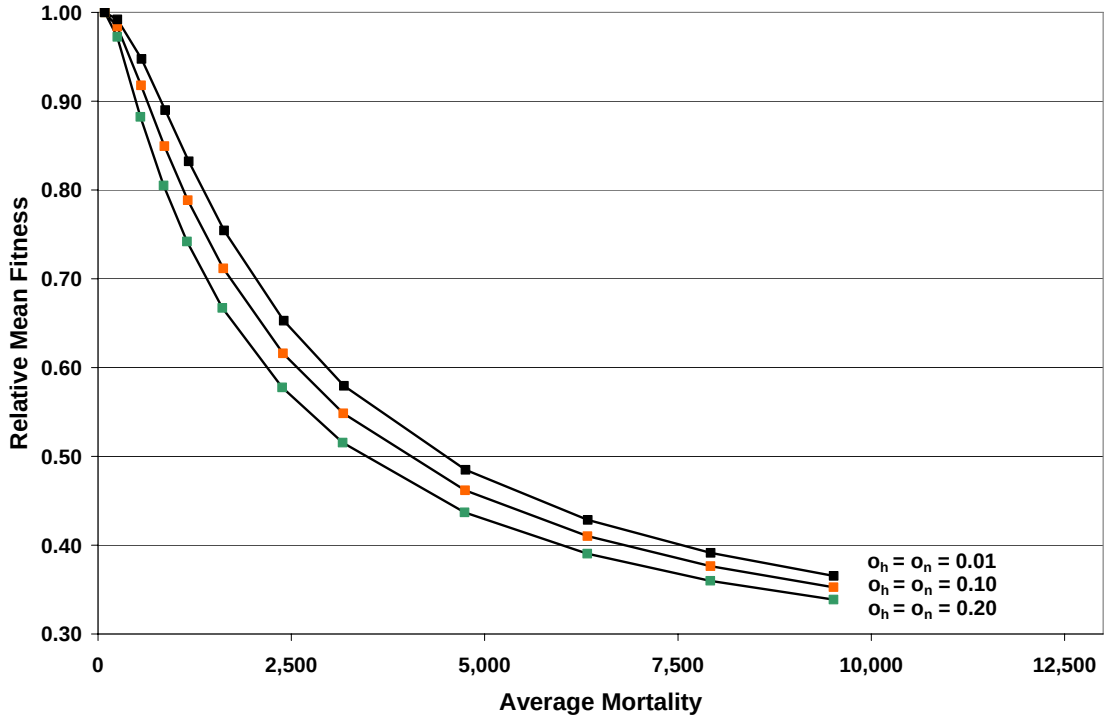

Figure 4-18. Relationship between fitness and fishery harvest mortality for varying levels of spawn timing overlap and poor habitat productivity (a=1.75; b=1,500).

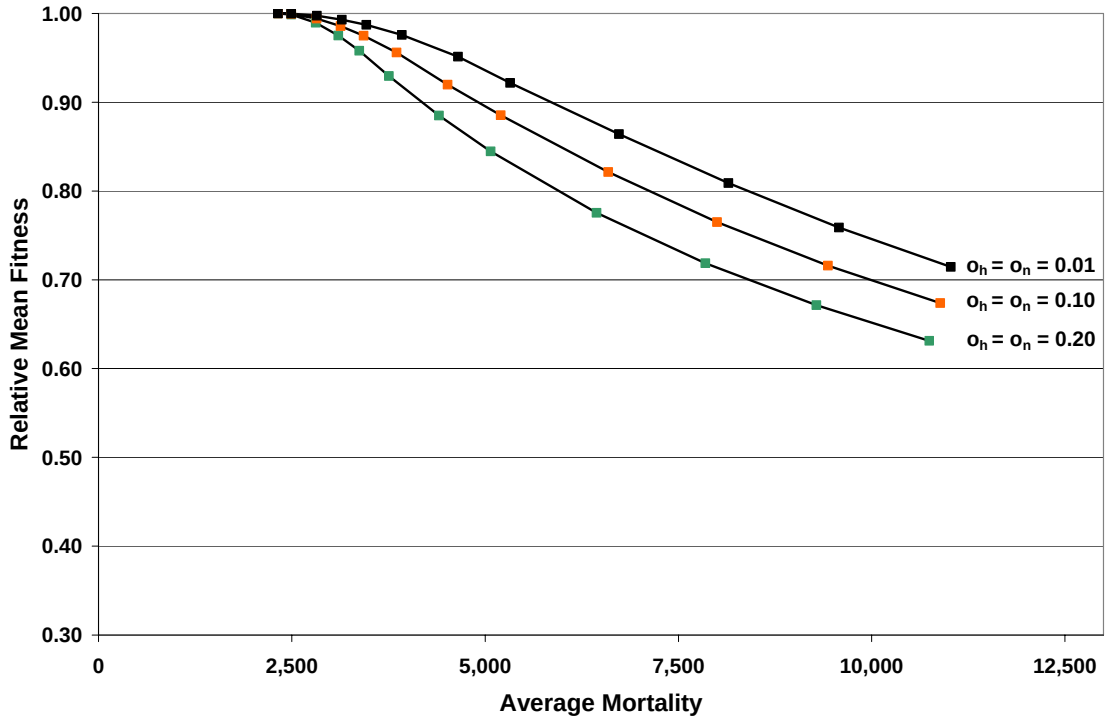

Figure 4-19. Relationship between fitness and fishery harvest mortality for varying levels of spawn timing overlap and good habitat productivity (a=7.00; b=6,000).

4.8 Harvest Regulation Tactics

Regulation tactics are the methods used in the fishery to implement the harvest strategy. They may be broadly categorized as either input controlled or output controlled (Walters and Martell 2004). An input controlled approach attempts to limit exploitation rates through time and area closures, effort limitations, bag limits, or direct assessment of exploitation rates. Conversely, in an output controlled fishery, the total allowable catch (or mortality) is established prior to the season, catch is monitored as the fishery proceeds, and the fishery is closed when the catch (or output) meets the control point. In general, the information required to implement output control are more extensive and costly to collect. Estimates of abundance, in particular, must be accurate to successfully implement an output control approach.

The choice of tactics is likely to depend on the fishery harvest strategy and fishery specific variables such as the intensity of the fishery, uncertainty in estimates of steelhead abundance, vulnerability, and fishing effort, and variability in recruitment rates. Hilborn and Walters (1992) provided a qualitative evaluation of the merits of various combinations of strategies and tactics (Table 4-6). When uncertainty exists only in the estimate of abundance, they suggest that the best tactic for a constant escapement strategy is limits on the season; the best tactic for a constant exploitation strategy is limitation of fishing effort.

Table 4-6. Relative merits of tactics and strategies when uncertainty exists only in abundance.

Strategy	Tactic		
	Catch Quota	**Time Limitation**	**Effort Limitation**
Constant Escapement	Worst	Best	Medium
Constant Harvest Rate	Worst	Medium	Best
Constant Catch	Best	Worst	Medium

A more productive approach would be to analyze the complete cycle of data gathering, analysis, and fishery implementation using closed-loop analyses (Punt and Smith 1999; Sainsbury et al. 2000). Walters and Martell (2004) suggest that this approach has been "extraordinarily helpful in detecting problems in stock-assessment methods, evaluating alternative investments in data gathering, and solving problems that can arise when assessment procedures are "linked" to practical management."

4.8 Additional Technical Questions

Several technical questions arose during the preparation of this chapter that will require additional evaluation. These technical questions will be broadly discussed in the final version of this report and more specifically addressed in subsequent fishery management plans.

1) How has the run timing of natural populations of steelhead been affected by fisheries targeting early-timed winter steelhead of hatchery-origin.
2) What is the mortality of steelhead in catch–and-release fisheries?
3) What spawning levels are associated with population viability, maximum sustainable harvest, maximum production, or some other reference point?

4.9 Discussion

Perhaps the most complicated and controversial species for WDFW to manage is the state fish – the steelhead. Steelhead, and in particular natural-origin steelhead, stir deep emotions among both recreational anglers and Native American fishermen.

Substantial evolution in steelhead management steelhead has occurred during the last 50 years in response to improved understanding of the biological requirements of *O. mykiss* and the potential effects of anthropogenic actions. These evolutionary steps include:

Fisheries on Juvenile Steelhead (1940s and 1950s). Information on the timing of smolt migration and mortality of juvenile steelhead in freshwater trout fisheries (Meigs and Pautzke 1941) led to a delay in the opening of freshwater recreational fisheries (Larson and Ward 1954).

Effects of Domesticated Hatchery-Origin Steelhead (1970s and 1980s). Concerns about the potential effects of domesticated hatchery-origin steelhead on the fitness of naturally spawning populations (Royal 1973) led to research on the fitness of hatchery-origin steelhead that spawned naturally (Crawford et al. 1977). Findings from the research led to improved tools to evaluate the potential effects of the release of hatchery steelhead smolts (Hulett and Leider 1993) and to modification of release levels.

Fishery Harvest Rates on Natural-Origin Steelhead (1980s). Concerns about increases in harvest rates on natural-origin steelhead led to the marking of hatchery production, mark-selective fisheries, and the identification of escapement goals (Gibbons et al. 1985).

Interactions with Hatchery-Origin Rainbow Trout (1980s and 1990s). Research on the potential ecological and genetic interactions of hatchery-origin juvenile rainbow trout and juvenile steelhead (Campton 1985) led to policies restricting the release of hatchery-origin rainbow trout in anadromous waters (WDG 1984).

Each change in management, and often the supporting monitoring and research, was greeted with skepticism, but in hindsight each was a step forward in steelhead management.

New monitoring and research have provided additional insights on the biology of *O. mykiss*, yet heightened concerns exist over the status of some populations. Increased recognition of the importance of the diversity and spatial structure of steelhead, the potential effects of hatchery-origin steelhead on the diversity and fitness of natural populations, and the genetic and ecological interactions of trout and steelhead are new frontiers that will shape the continued evolution of management. Incorporation of these elements will require a new generation of analytical tools that facilitate the evaluation of management trade-offs, trade-offs that must be evaluated in the broader context of the interacting effects of habitat productivity, fishery harvest, and hatcheries.

The complex jurisdictional responsibilities, extensive habitat changes, increasing human population of the state, and the multiple desires of user groups challenge the department to meet its mandate to preserve, protect and perpetuate the resource and maximize public recreational opportunities and meet tribal obligations. The development and implementation of improved, integrated strategies for habitat, fishery harvest, and hatchery management will likely require a heightened level of interaction with local governments and collaboration with stakeholders. Extensive discussion with stakeholders will be needed to evaluate steelhead management trade-offs, generate and discuss new strategies, and solicit review and comment on alternative strategies. In addition to the existing Fish and Wildlife Commission process, the Steelhead and Cutthroat Policy Advisory Group, and regulatory processes such as the State Environmental Protection Act, these discussions might be enhanced through informal workshops and focus groups.

4.10 Findings and Recommendations

Finding 4-1. Steelhead fisheries are an important part of the cultural heritage of Washington and provide substantial economic benefits. Steelhead and anadromous salmonids are of nutritional, cultural, and economic importance to Native American tribes. Known for their explosive power and their preference for fast-flowing rivers,

these fish have long held a special place in the lore of Northwest anglers. Recreational fishers spent an average of $105 million dollars per year fishing for steelhead during the last decade with an associated economic output of over $200 million dollars per year.

Finding 4-2. Management of steelhead fisheries is based on a complex web of federal and state court orders, federal regulations associated with the Endangered Species Act, and state statutes. Many steelhead fisheries in Washington are managed cooperatively with Native American tribes in a unique government-to-government relationship defined by treaties, court decisions, and legislation. The *U.S. v. Washington* and *U.S. v. Oregon* decisions determined that the Treaty Tribes and non-Indians are each entitled to a fair share of fish, defined as equal shares of harvestable salmon or steelhead.

Finding 4-3. The recreational catch of steelhead has fluctuated cyclically during the last 30 years, ranging from approximately 193,000 in the 2001-2002 season to a low of less than 59,000 in the 1998-1999 season. Variations in the recreational catch can reflect many factors, including the abundance of steelhead, the catchability of steelhead as affected by conditions such as stream flow, and fishing regulations. Four peaks in the catch of steelhead are evident during the 30 years, separated by approximately by 7 to 9 year periods of declining catch.

Finding 4-4. The percentage of the recreational catch of steelhead originating from natural production has declined from 26% in the 1987-1988 season to approximately 1% in the 2004-2005 season. The cautious management approach implemented by WDFW in the mid-1980s, including mark-selective fisheries, has effectively reduced the catch of natural-origin steelhead while providing opportunities to harvest steelhead of hatchery-origin.

Finding 4-5. Angler interest in catch-and-release fisheries has increased relative to 1987. Phone surveys indicate that anglers are becoming more likely to release steelhead that can be legally retained. In the 1987 survey, anglers indicated that an average of 14% of the steelhead landed were released; this increased to 40% in 1995 and 42% in 2003.

Finding 4-6. Achieving management goals for steelhead will be promoted by an integrated strategy for habitat protection and restoration, hatchery practices, and harvest management. A strategy describes the general approach that will guide management actions in the pursuit of a desired future state. Strategies for habitat, harvest, and hatchery production, often referred to as the all-H sectors, have often been developed and evaluated in isolation. Misalignment of strategies can result in unexpected population and ecosystem responses and can make it difficult to achieve goals.

Finding 4-7. Management of steelhead requires evaluation of the trade-offs between conflicting objectives and an effective process for determining where to operate along these trade-offs. Embedded in this paraphrasing of Walters and Martell (2004) are three important implications: 1) achieving all management objectives is rarely possible; 2) explicit evaluation of trade-offs promotes discussion and the development of improved strategies; 3) selection of strategies is not simply a technical analysis, but requires extensive communication and discussion with stakeholders. Trade-offs likely to be encountered in the management of steelhead include habitat quality versus spawner abundance, harvest level versus the fitness of the natural population, and population diversity versus versus harvest level.

Recommendation 4-1. Develop and implement improved methods and forums to inform constituents about steelhead management trade-offs, generate and discuss new strategies, and solicit review and comment on alternative strategies. In addition to the existing Fish and Wildlife Commission process and the Steelhead and Cutthroat Policy Advisory Group, these methods could include informal workshops and focus groups.

Recommendation 4-2. Building on the concepts developed in this paper, develop and apply on a population specific basis analytical tools to evaluate trade-offs between competing management objectives.

Recommendation 4-3. In conjunction with the fishery comanagers, continue to annually assess the predicted abundance of steelhead populations, identify allowable fishing rates, and monitor the impacts of fisheries.

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Appendix 4-1. Treaty Status of Indian Tribes in Washington and Adjacent Areas.

Native American tribes in Washington can be grouped into three broad categories relative to fishery management: 1) Treaty tribes (i.e., entitled to exercise treaty rights); 2) federally recognized non-treaty tribes; 3) and non-treaty tribes that are not federally recognized. The following tables are from Woods (2006).

Treaty Tribes (i.e, entitled to exercise treaty rights)

Tribe	*Treaty*	*Authority for Tribe's Treaty Status*
Hoh	Olympia	*United States v. Washington,* 384 F. Supp. 312, 359 (W.D. Wash. 1974)
Jamestown S'Klallam	Point No Point	*United States v. Washington*, 626 F. 1405, 1486 (W.D. Wash. 1984)
Lower Elwha Klallam	Point No Point	*United States v. Washington*, 459 F. Supp. 1020, 1039-40 (W.D. Wash. 1975)
Lummi	Point Elliott	384 F. Supp. at 360
Makah	Neah Bay	384 F. Supp. at 363
Muckleshoot	Medicine Creek, Point Elliott	384 F. Supp. at 365
Nez Perce (ID)	Nez Perce	*Sohappy v. Smith*, 302 F. Supp. 899, 904 (D. Or. 1969)
Nisqually	Medicine Creek	384 F. Supp. at 367
Nooksack	Point Elliott	459 F. Supp. at 1040-41
Port Gamble S'Klallam	Point No Point	459 F. Supp. at 1039
Puyallup	Medicine Creek	384 F. Supp. at 370
Quileute	Olympia	384 F. Supp. at 372
Quinault	Olympia	384 F. Supp. at 374
Sauk-Suiattle	Point Elliott	384 F. Supp. at 375-76
Salish-Kootenai (MT) (no treaty rights confirmed in Washington at this time)	Hell Gate	*Moe v. Confederated Salish & Kootenai Tribes*, 425 U.S. 463, 466 (1976)
Shoshone-Bannock (ID) (no treaty rights confirmed in Washington at this time)	Fort Bridger	*State v. Tinno*, 497 P.2d 1386, 94 Idaho 759 (1972)
Skokomish	Point No Point	384 F. Supp. at 376
Squaxin Island	Medicine Creek	384 F. Supp. at 377
Stillaguamish	Point Elliott	384 F. Supp. at 378
Suquamish	Point Elliott	459 F. Supp. at 1040
Swinomish	Point Elliott	459 F. Supp. at 1039
Tulalip	Point Elliott	459 F. Supp. at 1039
Umatilla (OR)	Walla Walla	302 F. Supp. at 904
Upper Skagit	Point Elliott	384 F. Supp. at 379
Warm Springs (OR)	Middle Oregon	302 F. Supp. at 904
Yakama	Yakama	384 F. Supp. at 380

Non-treaty Tribes (Federally Recognized)

Tribe	*Authority for Tribe's Non-Treaty Status*
Chehalis	*Confederated Tribes of Chehalis Indian Reservation v. Washington*, 96 F.3d 334, 340-41 (9th Cir. 1996)
Coeur d'Alene (ID)	*Idaho v. United States*, 533 U.S. 262 (2001)
Colville (have off-reservation rights in former north half of Colville Reservation per *Antoine v. Washington*, 420 U.S. 194 (1975) and in part of Lake Roosevelt per 16 U.S.C. § 835d)	*United States v. Oregon*, 29 F.3d 481 (9th Cir. 1994)
Cowlitz	*See Wahkiakum Band of Chinook Indians v. Bateman*, 655 F.2d 176, 178-80 (9th Cir. 1981); *Confederated Tribes of Chehalis Indian Reservation v. Washington*, 96 F.3d 334, 340-41 (9th Cir. 1996)
Kalispel	*United States v. Pend Oreille Pub. Util. Dist.*, 926 F.2d 1502, 1508 n.6 (9th Cir. 1991)
Samish	*United States v. Washington*, 641 F.2d 1368 (9th Cir. 1981)
Shoalwater Bay	*Confederated Tribes of Chehalis Indian Reservation v. Washington*, 96 F.3d 334, 340-41 (9th Cir. 1996)
Snoqualmie	*United States v. Washington*, 641 F.2d 1368 (9th Cir. 1981)
Spokane (have off-reservation rights in part of Lake Roosevelt per 16 U.S.C. § 835d)	*Spokane Tribe of Indians v. United States*, 163 Ct. Cl. 58 (1963)

Non-Treaty Tribes (Not Federally Recognized)

Tribe	*Authority for Tribe's Non-Treaty Status*
Chinook (federal recognition denied 67 Fed. Reg. 46204 (July 12, 2002))	*Wahkiakum Band of Chinook Indians v. Bateman*, 655 F.2d 176, 178-80 (9th Cir. 1981); *see Confederated Tribes of Chehalis Indian Reservation v. Washington*, 96 F.3d 334, 340-41 (9th Cir. 1996)
Duwamish (federal recognition denied 66 Fed. Reg. 49966 (Oct. 1, 2001); H.R. 852 pending in 109th Congress)	*United States v. Washington*, 641 F.2d 1368 (9th Cir. 1981)
Snohomish (federal recognition denied 68 Fed. Reg. 68942 (Dec. 10, 2003))	*United States v. Washington*, 641 F.2d 1368 (9th Cir. 1981)
Snoqualmoo	*State v. Posenjak*, 127 Wn. App. 141, 111 P.3d 1206 (2005)
Steilacoom (petition for federal recognition pending. 65 Fed. Reg. 5880 (Feb. 7, 2000))	*United States v. Washington*, 641 F.2d 1368 (9th Cir. 1981)
Wanapum	*See* RCW 77.12.453